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Plan of Development

ELDORADO-IVANPAH TRANSMISSION LINE PROJECT

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Eldorado-Ivanpah Transmission Project

Appendix A – Mitigation Plans
(Continued)

Phase I ESA Nipton

Hazardous Materials and Waste Handling Management Plan

Soil Management Plan

Transmission Line Project Fire Plan

Water Use Plan

Dry Lake Restoration Plan

Drainage Crossing Design Plan

California Manual on Uniform Traffic Control Devices for Streets and Highways

Delineation of Waters of the United States and California Department of Fish and Game Jurisdictional Habitats

Approved Jurisdictional Determination

Desert Tortoise Survey

Burrowing Owl Survey

Golden Eagle Survey

Rare and Invasive Plants Survey Report

Raptor and Common Raven Surveys

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Eldorado-Ivanpah Transmission Project

Phase I Environmental Site Assessment
Nipton

Anticipated Submittal Date: 10/31/2011

Chehalis-Nesqually Transmission Project

Hazardous Materials & Waste Handling Management Plan

Eldorado-Ivanpah Transmission Project

Hazardous Materials & Waste Handling Management Plan

Eldorado-Ivanpah Transmission Project

Hazardous Materials and Hazardous Waste Handling Plan

Prepared for:

Southern California Edison

October 2011

Prepared by:

AECOM

Applicant Proposed Measures Covered:

APM-HAZ-2 Hazardous Materials and Waste Handling Management Program

APM-HAZ-5 Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan

APM-W-2 Erosion Control and Hazardous Material Handling

APM-W-10 Emergency Release Response Procedures

APM-W-12 Properly Dispose of Hazardous Waste

MM-HAZ-4 Disposal of Demolition Materials

MM-HAZ-5 Use of Backfill Materials

MM-HAZ-6 EPA Identification Number for Hazardous Waste Handling

Eldorado-Ivanpah Transmission Project

Hazardous Materials and Hazardous Waste Handling Plan

Prepared for:

Southern California Edison

October 2011

Prepared by:

AECOM

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List of Acronyms

APM	Applicant Proposed Measure
BLM	Bureau of Land Management
BMP	Best Management Practice
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHSC	California Health and Safety Code
CPUC	California Public Utilities Commission
CUPA	Certified Unified Program Agencies
EITP	Eldorado-Ivanpah Transmission Project
EPA	Environmental Protection Agency
FEIR/EIS	Final Environmental Impact Report/Environmental Impact Statement
F.R.E.D.	Field Reporting Environmental Database
HMBP	Hazardous Materials Business Plan
kV	kilovolt
MM	Mitigation Measure
MSDS	Material Safety Data Sheet
NAC	Nevada Administrative Code
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NRS	Nevada Revised Statutes
OE	Owner's Engineer
OSHA	Occupational Safety & Health Administration
PUCN	Public Utilities Commission of Nevada
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Concern
SCE	Southern California Edison
SES	Safety Environmental Specialist
SPCC	Spill Prevention Control and Countermeasure
SWPPP	Storm Water Pollution Prevention Plan
USDOT	United States Department of Transportation

1.0 Introduction

This Hazardous Materials and Hazardous Waste Handling Plan (Plan) for the construction phase of Southern California Edison's (SCE) Eldorado-Ivanpah Transmission Project (EITP) presents the activities to be conducted to support compliance with the Applicant Measures (APMs) and Mitigation Measures (MMs) listed in Table 1. Compliance with the APMs and MMs will reduce potential impacts from hazardous materials used and hazardous waste generated during construction of the transmission line. This Plan provides instructions for the safe handling, storing, shipping, and containment of hazardous materials and waste, identification of owner/operator contact information, and an emergency response/contingency plan.

1.1 Project Overview

SCE will construct the EITP transmission line, which will provide electrical transmission infrastructure to deliver new renewable generation from the Ivanpah Valley area to the California Independent System Operator grid. The EITP will consist of a new double-circuit 220-kilovolt (kV) electric transmission line, which will replace the existing 115-kV transmission line, including telecommunication system. Other components of the EITP include upgrades to the Eldorado Substation and construction of the new Ivanpah Substation. The transmission line will extend approximately 35 miles from the existing Eldorado Substation located 14 miles from Boulder City, Nevada, to the new Ivanpah Substation in California near Primm, Nevada (See Figures 1 and 2 for EITP Vicinity and Project Map). The EITP will consist of the work described in the following paragraphs.

Eldorado–Ivanpah 220-kV Transmission Line – A new double-circuit 220-kV transmission line, approximately 35 miles long, will be constructed between the existing Eldorado Substation and the proposed Ivanpah Substation. It will replace a portion of the existing 115-kV transmission line that runs from Eldorado Substation to Mountain Pass Substation, through Baker, Dunn Siding, and Cool Water substations. The existing 115-kV transmission line that runs west of the Ivanpah Substation to Mountain Pass Substation will remain unchanged and is not part of the EITP.

Sub-transmission Line – A proposed 600- to 800-foot-long addition to an existing 115-kV sub-transmission line will connect the remaining portion of the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass line to the Ivanpah Substation.

Distribution Lines – A proposed 33-kV distribution circuit, consisting of approximately 1 mile new underground 33-kV circuitry and two new Remote Control Switches that will be installed adjacent to Densmore Drive, will be constructed to provide light and power to the Ivanpah Substation and a microwave telecommunications site. One of the switches will be located south of the Ivanpah Substation and the second will be located next to the Primm Valley Golf Club's Desert Course. In addition, approximately 4,300 feet of a new 33-kV overhead line will be installed between the town of Nipton and the new microwave site proposed to be located northeast of Nipton.

Ivanpah Substation – The Ivanpah Substation will be located in California near Primm, Nevada, and will serve as a connector hub for solar energy generated in the Ivanpah Valley area. The substation will include a mechanical and electrical equipment room and a microwave tower.

Eldorado Substation – Changes inside the existing Eldorado Substation will be made to accommodate the new Eldorado–Ivanpah 220-kV transmission line.

Telecommunication System – Existing overhead ground wire will be replaced with optical ground wire on an approximately 25-mile section of the existing Eldorado–Lugo 500-kV transmission line. A 4.8-mile-long underground duct from the Eldorado–Lugo 500-kV transmission line to a proposed microwave telecommunications site in Nipton, California, will be installed. This microwave telecommunication site will consist of a communication building, a microwave tower, and an emergency generator. A microwave path (approximately 12 miles long) will be developed by installing two 180-foot-tall communication towers, one northeast of Nipton and one at the Ivanpah Substation. A communications room will be installed in the mechanical and electrical equipment room at the Ivanpah Substation to house communication equipment. Telecommunication equipment will also be installed at the Eldorado Substation. For the early interconnect phase of the EITP, one additional fiber optic path will be required to connect the new facilities at Ivanpah to the local telecom carrier at Mountain Pass. This willrequire the installation of approximately 8 miles of All Dielectric Self Supporting fiber optic cable willon the existing transmission structures.

1.2 Lead Agencies

Lead agencies have discretionary approval over the EITP and are responsible for reviewing aspects of the measures documented in this Plan. The U.S. Department of the Interior, Bureau of Land Management (BLM) is the federal lead agency responsible for compliance with the National Environmental Policy Act (NEPA). NEPA analysis was required as a result of BLM's decision making responsibility for a right-of-way application and to facilitate its decision to issue a permit to construct.

The California Public Utilities Commission (CPUC) has discretionary authority to issue a Certificate of Public Convenience and Necessity for SCE's portion of the EITP. As allowed by the California Environmental Quality Act (CEQA) Guidelines Section 15221, the CPUC used the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) (CPUC/BLM 2010) to provide the environmental review required under CEQA for their approval of the relevant portions of the EITP.

Furthermore, the Public Utilities Commission of Nevada (PUCN) has the authority to issue a permit to construct for the portions of the EITP facilities constructed in Nevada. As allowed by the Nevada Utility Regulations, Chapter 704 – (Nevada Revised Statutes [NRS] 704.877) the PUCN has a duty to accept and incorporate findings and conclusions of environmental reviews that already have been conducted by an appropriate federal agency or by a state, regional or local agency . The PUCN will cooperate with other permitting agencies and the appropriate federal agencies on applications for permits, licenses and other approvals to construct a utility facility and coordinate their activities, including, without limitation, conducting hearings or environmental reviews to avoid duplication of activities.

1.3 Applicant Proposed Measures & Mitigation Measures

The APMs and MMs addressed in this Plan are listed in Table 1. A Hazardous Materials and Hazardous Waste Handling Plan and an Emergency Release Response Procedures Plan are listed as submittal requirements for APM-HAZ-2. The requirements for these plans have been incorporated into this Plan to facilitate the accessibility of the information for workers.

Table 1 Applicant Proposed Measures & Mitigation Measures

Measure*	Description
APM-HAZ-2	Hazardous materials used and stored on site for the proposed construction activities, as well as hazardous wastes generated on site as a result of the proposed construction activities, will be managed according to the specifications outlined below: **Hazardous Materials and Hazardous Waste Handling Program:** A project-specific hazardous materials management and hazardous waste management program will be developed prior to initiation of the EITP. The program will outline proper hazardous materials use, storage and disposal requirements, as well as hazardous waste management procedures. The program will identify types of hazardous materials to be used during the EITP and the types of wastes that will be generated. All EITP personnel will be provided with project-specific training. This program will be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes will be handled and disposed of according to applicable rules and regulations. Employees handling wastes will receive hazardous materials training and shall be trained in hazardous waste procedures; spill contingencies; waste minimization procedures; and Treatment Storage, and Disposal Facility training in accordance with the Occupational and Safety Health Administration (OSHA) Hazard Communication Standard, Title 22, Division 4.5 of the California Code of Regulations (CCR) and Chapter 459.400-856 of the NRS. SCE will use landfill facilities that are authorized to accept the waste in accordance with the California Health and Safety Code (CHSC) Division 20, Chapter 6.5, Article 4, Section 25143.1.5(b) (CHSC 2011) and Nevada Administrative Code (NAC) Chapter 444.570-444.5759 and landfills that are also on the SCE Corporate-approved disposal list **Construction Storm Water Pollution Prevention Plan (SWPPP):** A project-specific construction SWPPP will be prepared and implemented prior to the start of construction of the transmission line and substations. The SWPPP will use Best Management Practices (BMPs) to address the storage and handling of hazardous materials and sediment runoff during construction activities (California Storm Water Quality Association 2004 and Nevada Department of Environmental Protection Bureau of Water Pollution Control June 2008). **Transport of Hazardous Materials:** Hazardous materials that will be transported by truck include fuel (diesel fuel and gasoline), and oil and lubricants for equipment. Containers used to store hazardous materials will be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used will be established in accordance with United States Department of Transportation (USDOT), California Department of Transportation (Caltrans), and Nevada Department of Transportation (NDOT) regulations. A qualified transporter will be selected to comply with federal and state transportation regulations. **Fueling and Maintenance of Construction Equipment:** Written procedures for fueling and maintenance of construction equipment will be prepared prior to construction. Vehicles and equipment will be refueled on site or by tanker trucks. Procedures will include the use of drop cloths made of plastic, drip pans, and trays to be placed under construction equipment in refueling and maintenance areas to ensure that chemicals do not come into contact with the ground. Refueling stations will be located in designated areas where absorbent pads and trays will be available. The fuel tanks will also contain a lined area or other protection means to ensure that

	accidental spillage is adequately contained. Drip pans or other collection devices will be placed under the equipment at night to capture potential drips or spills. Equipment will be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants will be kept in an approved locker or storage cabinet. **Fueling and Maintenance of Helicopters:** Written procedures for fueling and maintenance of helicopters will be prepared prior to construction. Helicopters will be refueled at helicopter staging areas or local airports. Procedures will include the use of drop cloths made of plastic, drip pans, and trays to be placed under helicopters within the refueling and maintenance areas to ensure that spilled chemicals do not come into contact with the ground. Refueling areas will be located in designated areas where absorbent pads and trays are available. **Emergency Release Response Procedures:** An Emergency Response Plan detailing responses to releases of hazardous materials will be developed prior to construction activities. It will prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, will be immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain if the spill impacted any sensitive area, including conservation areas and wildlife preserves, or if the spill causes injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, will be aware of state and federal emergency response reporting guidelines.
APM-HAZ-5	**Spill Prevention, Countermeasure, and Control (SPCC) Plan and Hazardous Materials Business Plan (HMBP):** In accordance with Title 40 of the Code of Federal Regulations (CFR), Part 112, SCE will prepare a SPCC Plan for proposed and/or expanded substations. The SPCC Plan will include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup. Prior to operation of new or expanded substations, SCE will prepare or update and submit, in accordance with Chapter 6.95 of the CHSC, and Title 22 CCR, an HMBP. The required documentation will be submitted to the designated Certified Unified Program Agency (CUPA) in California. (An HMBP or similar documentation is not required by Nevada.) The HMBP will include hazardous materials and hazardous waste management procedures, and emergency response procedures including emergency spill cleanup supplies and equipment.
APM-W-2	**Properly Dispose of Hazardous Materials:** All construction and demolition waste, including trash and litter, garbage, and other solid waste, will be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials will be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
APM-W-10	**Emergency Release Response Procedures:** The Emergency Release Response Procedures developed pursuant to APM-HAZ-2 will be maintained on site (or in vehicles) during construction of the EITP.
APM-W-12	**Erosion Control and Hazardous Material Plans:** Erosion control and hazardous material plans will be incorporated into the construction bidding specifications to ensure compliance.

MM-HAZ-4	**Disposal of Demolition Materials:** All debris generated during EITP-related demolition of structures, buildings, asphalt, or concrete-paved surface areas must be tested for the presence of expected hazardous chemicals, such as mercury, asbestos, and any other materials that may be deemed hazardous before disposal. SCE will ensure that the materials are properly disposed of depending on the sampling results.
MM-HAZ-5	**Backfill Material.** If backfill material is used, it will be sampled and determined to be contaminant-free before it is used to fill excavations.
MM-HAZ-6	**U.S. Environmental Protection Agency (EPA) Identification Number.** If it is determined that hazardous waste will be generated during construction, SCE will obtain an EPA Identification Number before construction begins. Before construction begins, SCE will also determine whether the treatment or the handling or the storing of hazardous materials will require authorization of the local CUPA. If necessary, SCEmust receive authorization from the local CUPA before construction begins.
The SWPPP, Soil Management Plan, HMBP, and SPCC Plan are separate plans and are not included in this Hazardous Material and Hazardous Waste Handling Plan.	

1.4 Applicable Activities and Project Areas

The activities addressed in this Plan include the proper use, handling, storage, and disposal of hazardous materials and waste; emergency response procedures in the event of a hazardous material release; and guidelines for identifying, assessing, excavating, storing, sampling, and disposing of impacted soil or water.

This Plan is applicable to all SCE components of the construction activities on the transmission line path between Eldorado and Ivanpah substations.

1.5 Timing

The measures described in this Plan are applicable for the following periods of the EITP, as shown in Table 2.

Table 2 Timing of Applicant Proposed Measures & Mitigation Measure Applicability

Applicant Proposed Measure/ Mitigation Measure	Description	Period		
		Pre-Construction	Construction	Post-Construction
APM-HAZ-2	Hazardous Materials and Hazardous Waste Handling Program	✓	✓	✓
APM-HAZ-5	SPCC Plan and HMBP		✓	✓
APM-W-2	Disposal of Hazardous Materials	✓	✓	✓

Table 2 Timing of Applicant Proposed Measures & Mitigation Measure Applicability

Applicant Proposed Measure/ Mitigation Measure	Description	Period		
		Pre-Construction	Construction	Post-Construction
APM-W-10	Emergency Response Procedures	✓	✓	✓
APM-W-12	Erosion Control and Hazardous Material Plan	✓	✓	✓
MM-HAZ-4	Disposal of Demolition Waste if Deemed Hazardous	✓	✓	✓
MM-HAZ-5	Use of Backfilling Material	✓	✓	✓
MM-HAZ-6	Obtaining an EPA ID Number	✓	✓	✓

2.0 Methods

This section includes a detailed description of the actions required to implement the applicable APMs and MMs for the EITP. The FEIR/EIS does not identify any portion of the project area as a Recognizable Environmental Concern (REC). However, unexpected RECs may be encountered during construction, and the use and storage of hazardous materials on site could result in accidental spills or releases that could threaten soil or groundwater if preventive measures are not established. Examples of hazardous materials that may be present on site, and their respective uses, are listed in Table 3. The following sections of this Plan include descriptions of the actions required to comply with the APMs and MMs required by the FEIR/EIS, as well as the responsibilities and coordination required between SCE and the construction contractor to implement such actions.

Table 3 List of Proposed Hazardous Materials

Hazardous Material	Purpose
Diesel Fuel	Construction equipment and vehicles
Gasoline	Construction equipment and vehicles
Motor Oil	Construction equipment and vehicles
Hydraulic Fluids and Lubricating Oils	Construction equipment and vehicles
Soil Stabilizers	Roads, assembly areas, and material yards
Mineral Oil	Transformers
Compressed Gas	Welding
Welding Rods	Welding
Approved Herbicides	To control invasive weeds, on an as needed basis
Batteries, Paint, Thinners and Cleaning Solvents	Miscellaneous construction activities
Add as Necessary (SCE to provide final list)	

2.1 APM-HAZ-2: Hazardous Materials and Waste Handling Management Program – Construction Equipment and Vehicles

The construction contractor shall be responsible for complying with federal, state, and local requirements for the handling, storage, transport, and disposal of hazardous materials and hazardous waste, as well as nonhazardous construction waste. The construction contractor shall be responsible for implementing the performance requirements identified in this Plan.

Construction contractor personnel responsible for handling hazardous materials and waste for the EITP shall be trained in accordance with the requirements set forth in CCR Title 22, Division 4.5 (Environmental Health Standards for the Management of Hazardous Waste) and NRS Chapter 459 (Hazardous Materials) regarding the proper use and management of these materials, and shall be familiar with applicable laws, policies, procedures, and BMPs. Spill response personnel will be trained to work with hazardous materials and will be familiar with the construction contractor's

emergency response procedures. SCE personnel that visit or work on the construction site will also be familiar with and follow these applicable requirements. All construction personnel will be responsible for complying with federal, state, and local requirements, including applicable permits, laws, and ordinances related to hazardous materials and hazardous waste management.

The plans required under APM-HAZ-2 include hazardous materials and waste handling program, transport and disposal procedures, procedures for fueling construction equipment and procedures for fueling helicopters. For this Plan, the hazardous materials management program is presented in section 2.1.1 and the waste handling management program is presented in section 2.1.2. The transportation and disposal procedures are presented in section 2.1.3 and the emergency release response procedures are presented in section 2.1.4. The fueling and maintenance procedures for construction equipment are presented in section 2.1.5 and the fueling and maintenance procedures for helicopters are presented in section 2.1.6.

2.1.1 Hazardous Materials Management Program

Controlling Hazardous Materials

Hazardous material is defined as any material that, due to its quantity, concentration, or physical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or environment. Generally, the term "hazardous material" refers to materials brought on site for use during construction either as part of the construction process (for example, diesel fuel used by construction equipment) or as part of the EITP itself (for example, mineral oil used in transformers, which will remain on site during project operations). To the extent possible, the construction contractor shall minimize the use of hazardous materials. The construction contractor shall make every effort to use chemicals presenting the least environmental hazard wherever possible. During construction activities, hazardous materials will be properly used, stored, and disposed of in accordance with manufacturer recommendations and local, state, and federal regulations. Hazardous materials stored on site and used during construction will be documented in a Hazardous Materials Inventory, in accordance with APM-HAZ-2. A Hazardous Materials Inventory Form is included in Appendix A. The Hazardous Materials Inventory Form shall be completed by the construction contractor for new material brought on site or if the amount to be stored on site changes significantly. The hazardous materials inventory shall be maintained by the construction contractor and be used by SCE to prepare and/or modify the HMBP as required by NRS Chapter 459, Title 19, Division 2; CCR Title 22, Division 4.5; and CHSC Chapter 6.95 and applicable local regulations. The Hazardous Materials Inventory Form shall not be submitted to the CUPA in lieu of completing and submitting the required CUPA forms. The construction contractor shall maintain a current inventory of hazardous materials, provide Material Safety Data Sheets (MSDSs), and shall communicate changes in the hazardous materials inventory to SCE.

Storage and Transport

Hazardous materials will be stored in accordance with CFR Titles 40 and 49 ; NRS Chapter 459; and CCR Title 22, Division 4.5. Where possible, hazardous materials will be kept in their original containers and the containers will be clearly marked and periodically inspected. Procedures shall be implemented by the construction contractor to prevent leaks and spills during storage and transport. Procedures shall include periodic inspections of storage and containment areas, inspection of containers prior to transport, and documentation of corrective actions taken to prevent leaks and spills. Qualified personnel shall properly label hazardous materials containers, keep containers in good condition, follow written procedures for the transport of hazardous materials, and transport hazardous materials in accordance with all federal, state, and local requirements. The accumulation

and storage of hazardous material shall be performed in a manner that meets or exceeds the requirements set forth in CCR Title 22, Division 4.5 and NRS Chapter 459.

Inspections and Records

The construction contractor will regularly inspect hazardous materials storage areas for spills or leaks from containers. Regular inspections are BMPs that will be performed during construction to reasonably prevent spills or leaks. If a spill or leak is detected, immediate action will be taken to clean up and implement the necessary corrective actions. The inspections and corrective actions will be documented and records maintained on site. A Spill Log/Report Form is included in Appendix B. A Spill Log/Report Form shall be completed by the construction contractor in the event a leak or spill is discovered. Reports will be uploaded into SCE's Field Reporting Environmental Database (F.R.E.D.) and the contractor's project management database.

Performance Requirements

The following performance requirements related to hazardous materials management will be adhered to by the construction contractor at a minimum:

- Minimize the use of hazardous materials to the extent possible. Use non-hazardous or less hazardous alternatives when possible.
- When feasible, limit the storage and transfer of hazardous materials to within construction yards or staging areas.
- Take preventative measures to avoid hazardous material spills or leaks.
- Promptly clean up spills or leaks and document the corrective action.
- Have hazardous materials Material Safety Data Sheets readily available on site.
- Properly label all containers indicating the contents and keep containers closed when not in use.
- Store incompatible materials in separate areas.
- Maintain a visible first aid station on material laydown sites.

2.1.2 Hazardous Waste Management Program

The construction contractor is fully responsible for identifying, handling, storing, and transporting wastes in accordance with CFR Titles 40 and 49, NRS Chapter 459.400-856, and CCR Title 22, Division 4.5. The construction contractor shall provide SCE/Owner's Engineer (OE) with the names and telephone numbers of persons responsible for the hazardous waste management program.

Waste Generation

Typical wastes that may be generated during construction activities are paints, spent solvents, waste lubricants, spent oil-absorbent materials, and impacted soil. Equipment that is decommissioned as part of the substation expansions will be disposed of or recycled, in accordance with CFR Title 40, NRS Chapter 459.400-856 and CCR Title 22, Division 4.5. Utility wood pole waste may be generated during decommissioning of existing lines. Utility wood pole waste will be disposed of in accordance with CHSC 25143.1.5 and NRS Chapters 459.400 - 459.645 for Nevada. A list of approved disposal facilities that accept treated wood waste in California is provided in Appendix D.

Hazardous Waste Handling

All wastes will be handled in a safe and environmentally sound manner. Hazardous waste will be generated and stored at "remote sites" during project construction. A remote site is one where hazardous waste is generated, but is not routinely staffed and is not adjacent or connected to a staffed project site. Many sites at the EITP qualify as remote sites. Waste from remote sites will be handled and transported to a consolidation site in accordance with the applicable sections of CFR Title 40, NRS Chapter 459.400-856, and CCR Title 22, Division 4.5, and in accordance with the requirements of the USDOT, NDOT, and Caltrans.

Storage, Containerization, and Labeling

Hazardous waste will be accumulated and stored on site during construction. Hazardous waste will be managed by the construction contractor in accordance with local, state, and federal guidelines. The construction contractor shall maintain a readily accessible supply of spill control measures, implement secondary containment measures as warranted, and conduct periodic inspections in accordance with state and federal regulations. Accumulation periods will be monitored, and disposal of hazardous waste will occur in accordance with CCR Title 22, CFR Title 40 and NRS Chapter 459 Part 400.

Transportation and Disposal

The construction contractor will pack, label, store, handle, transport, and dispose of hazardous wastes in compliance with CCR Title 22, CFR Titles 40 and 49 and NRS Chapter 459 Parts 400 and 700. The construction contractor shall notify the appropriate agencies of any hazardous waste dumped by third parties in the work area. The construction contractor shall document and maintain a record of contact of all agencies notified of hazardous waste dumped by third parties in the work area.

Inspections and Records

The construction contractor will regularly inspect hazardous waste storage areas for spills or leaks from containers. Regular inspections are BMPs that will be performed during construction to reasonably prevent spills or leaks. For hazardous waste storage areas (either satellite or the temporary storage areas), documented weekly inspections are required and records will be maintained on site. If a spill or leak is detected, immediate action will be taken to clean up and implement the necessary corrective actions. The inspections and corrective actions will be documented and records maintained on site. A Spill Log/Report, provided in Appendix B, shall be completed by the construction contractor in the event a leak or spill is discovered. Reports will be uploaded into SCE's F.R.E.D. and the contractor's project management database.

Performance Requirements

As a summary, the following performance requirements related to hazardous waste management will be adhered to by the construction contractor:

- Clearly identify and secure hazardous waste storage area.
- Take preventative measures to avoid spills or leaks in hazardous waste storage areas or during handling or transport of wastes.
- Promptly clean up spills or leaks and document the corrective action.
- Limit the storage of hazardous waste to designated storage areas.

- Prohibit overnight storage of hazardous waste in non-secure, designated storage areas.
- When feasible, implement waste recycling programs for all applicable waste streams.
- Properly label all waste containers and keep incompatible wastes segregated.
- Assure that all containers are kept closed when waste is not actively being added or removed.
- Train construction personnel in proper hazardous waste management procedures.

Spill Prevention and Containment for Construction and Operation

The construction contractors shall comply with the SPCC Plan, developed by SCE for the EITP in accordance with federal regulations to protect the environment from spills of petroleum products (CFR Title 40). The construction contractors shall also comply with the BMPs found in the SWPPP that relate to spill prevention, control, and cleanup. The SWPPP will be developed by SCE for the EITP and will be separate from the SPCC Plan. A separate SPCC Plan will be developed for the operation of the newly constructed and expanded substation facilities of the EITP in accordance with federal regulations.

Training

All personnel working on the EITP will receive environmental training. This training does not relieve the construction contractors of the responsibility to train employees as required by federal, state, and local regulations. Construction contractor personnel who handle hazardous wastes will have been trained in accordance with OSHA Hazardous Communication Standard; CFR Title 29, Part 1910; and CCR Title 8, Section 5194. Workers responsible for managing generated waste, conducting hazardous waste inspections, or involved in emergency response procedures will be trained on hazardous materials and waste management procedures, emergency and spill response procedures, and waste minimization procedures. Training records will be maintained per the applicable regulations referenced above.

2.1.3 Transportation and Disposal Procedures

The construction contractor shall pack, label, store, handle, transport, and dispose of hazardous material and hazardous waste in compliance with CFR Titles 40 and 49, NRS Chapter 459, 400-856, and CCR Title 22, Division 4.5, and in accordance with USDOT, NDOT, and Caltrans requirements. The construction contractor shall notify the appropriate agencies of any hazardous waste dumped by third parties in the work area. The construction contractor shall document and maintain a record of contact of all agencies notified of hazardous waste dumped by third parties in the work area, and provide copies of these records to SCE's Site Environmental Safety officer.

2.1.4 Emergency Release Response Procedures

Emergency release response procedures provide guidance for personnel to respond safely and quickly to hazardous materials spills or releases to prevent adverse impact to human health or impact to surrounding environmental media such as streams, lakes, wetlands, or storm water system or sensitive areas including conservatories and wildlife areas. Emergency release response procedures will be developed and implemented by the construction contractor for the EITP and will include identification of roles, responsibilities, standards for notification and external reporting, and documentation required upon discovery of a release of hazardous material. The construction contractor will follow the emergency release response procedures for the EITP. Construction personnel, SCE personnel, construction monitors, and other field personnel will be trained on the

emergency release response procedures. The emergency release response procedures will be documented on the Emergency Release Response Form provided in Appendix C.

The construction contractor will include site maps of the material yards, staging areas, and work areas that identify storage and applicable BMPs for hazardous materials and hazardous waste. The site maps will include the location of hazardous materials and waste handling and storage areas, spill response materials and equipment, MSDSs, storm and sewer drains, adjacent waterways, and emergency evacuation assembly area. The construction contractor shall provide SCE with the names and telephone numbers of persons responsible for managing the emergency release response procedures as part of the Emergency Release Response Form.

Reporting

In accordance with these emergency release response procedures, hazardous material spills or releases, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, will be immediately reported to SCE and the OE by the construction contractor if the spill enters a navigable water, stream lake, wetland, or storm drain; impacts sensitive areas including conservation areas and wildlife preserved; or causes injury to a person or threatens injury to public health.

SCE will notify the CPUC/BLM Environmental Monitor immediately for all incidents within sensitive resource areas, including sensitive habitat, riparian areas, water bodies, and drainages.

The following outlines the construction contractor's notification and reporting procedure for a hazardous material release or threat of a release:

- **Discovery.** The first step in the process is to discover the release or threat of a hazardous material release.
- **Initial Actions.** If the release has a potential to be an immediate danger to life or health, the construction worker shall call 911 and ask for assistance. If the release is incidental to the construction worker's job, SCE shall be notified immediately, trained spill response personnel will clean up the spill, and the necessity for agency notification will be evaluated by SCE. The spill response personnel will be trained to work with hazardous materials and is familiar with the construction contractor's emergency release response procedures. If the release is not incidental to the construction worker's job, then he will notify his immediate supervisor or the construction contractor and the latter will determine whether an emergency response person is capable of cleaning up the spill. If capable, the emergency response person will clean up the spill; but if not, the supervisor or construction contractor will follow the procedure below.
- **Internal Notification and Evaluation.** If a spill cannot be cleaned up by an emergency response person, as determined by the supervisor or construction contractor, the latter notifies SCE and OE personnel of the release. After notifying SCE personnel of the release, the construction contractor shall notify the applicable regulatory agencies (see agency notification below). Response will depend on several factors including the following:
  - If large quantities of hazardous materials were released;
  - If an environmental specialty contractor will be contacted to manage the clean up;
  - If specialized personal protective equipment is required for the cleanup;
  - If property owners or the community are concerned about the release;
  - If there is a threat to the public;

  - If there is a threat to surface waters;
  - If a sensitive environment is or may be affected;
  - If a highway or roadway is affected;
  - If a traffic lane is closed due to the release;
  - If regulatory agencies or emergency response personnel are on site; or
  - If there is a reasonable belief that the release poses a significant hazard to human health and safety, property, or the environment.

- **Agency Notification**. The construction contractor will notify the SCE construction manager. SCE will notify applicable agencies of the incident as per the EITP communication plan in accordance with federal, state, and local spill reporting requirements. When notifying agencies of a release, notification forms will be completed to document the agency contact.

When contacting 911 or a government agency, the following information will be provided:

- The exact location of the release or threatened release;
- The name of the person reporting the release or threatened release;
- The hazardous materials involved in the release or threatened release;
- An estimate of the quantity of hazardous materials involved; and
- The potential hazards presented by the hazardous material involved in the release or threatened release.

Documentation

The construction contractor shall complete required documentation on the Spill Log/ Report Form (Appendix B). The documentation will include records of spill or releases, regardless of the quantity or reporting requirements. The Spill Log/Report will be maintained at the construction site. Reports will be uploaded into SCE's F.R.E.D. and the contractor's project management database. SCE will provide CPUC and BLM documentation (i.e. Spill Log/Report) of spills and associated cleanup for all incidents within sensitive resource areas and any spill volume greater than 16 ounces. The Spill Log/Report will be submitted within 5 days of the occurrence. Regardless of size, the construction contractor shall be responsible for cleaning up a spill. The construction contractor may utilize a cleanup contractor as needed.

Emergency Release Response Equipment

The construction contractor shall provide a description of the spill response equipment that will be available on site as part of the Emergency Release Response form to the SCE Construction Manager. The location of the spill response equipment will be identified on site maps and communicated to construction personnel during training. The construction contractor will be responsible to maintain a current inventory of spill response equipment and regularly inspect and service equipment per manufacturer's recommendations. Construction vehicles will be equipped with spill response kits. The following material will be available at designated location(s) throughout the EITP area that are under active construction and easily accessible in the event that a spill may occur:

Large 55-gallon drum spill kits or "spill attack kits" will include:

- 3-ply or greater disposable plastic bags,

- 50 to 100 count 16-inch by 20-inch oil sorbent pads,
- 10 count 3-inch by 4-inch socks (if needed),
- Four pairs of Nitrile gloves,
- Two pairs of splash goggles, and
- A copy of the spill response procedure sheet.

Vehicle spill kits will include:

- 3-ply or greater disposable plastic bags,
- 16-inch by 20-inch oil sorbent pads,
- One to two pairs of Nitrile gloves, and
- A copy of the spill response procedure sheet.

The number of large spill kits will be adjusted to reflect the spread of crews along the right-of-way and the remoteness a particular crew may be in. Vehicle spill kits will be placed on all vehicles used by the project personnel.

Cleanup Procedures

The construction contractor will document containment and clean-up measures taken in the event of a spill or release of hazardous materials or hazardous waste. The spent spill response material, contaminated media, and spent personnel protective equipment will be placed into appropriate containers, properly labeled, and placed in an appropriate area until the hazardous waste can be transported and disposed at an appropriate disposal facility. For large spills or releases, if needed, SCE and the construction contractor will identify a cleanup contractor to respond.

Evacuation

The construction contractor will identify the emergency evacuation procedures. The emergency evacuation procedures will be identified for material yards, staging areas, and other construction work areas. The procedures will identify the methods for communicating the evacuation of on-site personnel and surrounding neighbors in the event of a serious incident. The evacuation areas will be identified on site maps. The emergency evacuation procedures prepared by the construction contractor will identify nearby hospitals and will provide the route from the site to the nearest hospital. These procedures and evacuation areas will be communicated in training and during on-site safety briefings to all personnel that visit the construction site.

Training

Construction contractor's personnel will be trained on the safety procedures in handling hazardous materials and the emergency release response procedures. The training will be completed prior to a new employee starting work at the site. Refresher training will be provided to all personnel annually. Training records will be maintained by the construction contractor. Training will be tailored to the construction worker's project role and responsibility during an emergency release response incident and will be site specific. At a minimum, the construction contractor's training will include:

- Emergency release response procedures;

- Location and use of emergency response equipment, materials, and personal protective equipment;
- Emergency evacuation procedures;
- Protocol for coordination and communication with local emergency response organizations; and
- Location, handling procedures, and uses of hazardous material.

2.1.5 Fueling and Maintenance Procedures for Construction Equipment

The construction contractor will be responsible for communicating the fueling and maintenance spill prevention measures to construction personnel to prevent leaks or spills of hazardous materials. The following fueling and maintenance spill prevention measures for construction equipment may be implemented during the construction of the transmission line:

- Refueling of construction vehicles and equipment to occur on site in designed areas, if possible.
- Plastic liners or drip pans placed under construction equipment while refueling.
- Plastic liners or other control measures used for fuel storage tanks to prevent spills from directly contacting the soil.
- Drip pans or other control measures placed under construction equipment when not operating to capture oil leaks.
- Construction equipment inspected daily for leaks and failures.

The above spill prevention measures will be implemented during all construction activities. When it is not practicable to use these measures, personnel will use appropriate precautions to prevent spills through safe work procedures and will be efficient in spill response procedures. Spill prevention is particularly critical in and around any sensitive areas including waterways and water bodies.

2.1.6 Fueling and Maintenance Procedures for Helicopters

The detailed fueling and maintenance spill prevention measures for helicopters will be developed and implemented by the helicopter contractor during the construction of the transmission line to prevent a release to the environment. At minimum, the following guidance is to be incorporated in the detailed helicopter fueling and maintenance procedures.

- Helicopters will be refueled only at designated staging areas or local airports.
- At staging areas, spill prevention measures such as drip pans or trays will be used to prevent a spill to the surrounding area.
- Safety precautions will be used during refueling of helicopters to prevent fueling and spill prevention equipment from interfering with the operation of the helicopter.
- Absorbent pads will be available in designated staging areas to quickly respond to fuel spills if it is not safe to use spill prevention measures during refueling.

2.2 APM-HAZ-5: Spill Prevention, Control, and Countermeasures Plan and Hazardous Materials Business Plan

2.2.1 Spill Containment and Response Equipment

The construction contractor shall maintain a readily accessible supply of spill control measures sufficient to contain potential spills, implement secondary containment measures as warranted, and conduct periodic inspections in accordance with state and federal regulations. The construction contractor shall maintain adequate quantities of spill containment and response equipment at readily accessible points throughout the site. Accumulation points shall be monitored, and disposal of hazardous waste shall occur in accordance with CCR Title 22 and CFR Title 40.

2.2.2 Inspections and Records

The construction contractor will regularly inspect hazardous material and hazardous waste storage areas for spills or leaks from containers. Regular inspections are BMPs that will be performed during construction to reasonably prevent spills and leaks. The inspections and any corrective actions will be documented and records of such will be maintained on site and with the SCE Construction Manager. The goal of these inspections is to detect potential problems before spills or leaks occur; therefore, any defective containers, containment mechanisms, or conditions that may create a spill or leak will be recorded and corrected. If a spill or leak is detected, immediate action will be taken to clean up and implement the necessary correction actions. A Spill Log/Report (Appendix B) shall be completed by the construction contractor in the event a leak or spill is discovered. Additional inspections will occur whenever a leak or condition that could cause a leak is noted, after a seismic event, and at the discretion of SCE/OE. Inspections should be conducted in accordance with the following schedule, at a minimum:

- Hazardous waste storage/work place accumulation area(s) conducted weekly;
- Hazardous materials storage area(s) conducted weekly;
- Spill control equipment conducted monthly;
- Personal protective equipment and other safety equipment conducted monthly;
- Portable fire extinguishers shall be visually inspected monthly and a maintenance check should be performed annually (California Department of Industrial Relations, NAC 477-410, National Fire Protection Act Code 10 Chapter 7);
- Storage tanks/tanker trucks (construction only) conducted weekly; and
- Oil-filled electrical equipment storage area (operations) conducted in accordance with SPCC Plan.

2.2.3 Performance Requirements

As a summary, the following performance requirements related to hazardous waste management shall be adhered to by the construction contractor:

- When feasible, implement waste recycling programs for all applicable waste streams.
- Separate hazardous from non-hazardous waste that cannot be recycled.
- Clearly identify and secure hazardous materials and hazardous waste storage areas.

- Take preventive measures to avoid spills or leaks in hazardous materials and hazardous waste storage areas or during handling or transport of wastes, including conducting routine inspections of the storage areas and containers on a regular basis.
- Limit the storage of hazardous materials and hazardous waste to designated storage areas.
- Prohibit overnight storage of hazardous materials or hazardous waste in non-secure storage areas.
- Properly label all waste containers and keep incompatible wastes segregated.
- Assure that all containers are kept closed when waste is not actively being added or removed.
- Train construction personnel in proper hazardous waste management procedures.

2.2.4 Maintenance of Emergency Spill Supplies

The construction contractor shall provide sufficient spill prevention and spill response equipment to contain foreseeable spills and hazardous waste releases, and shall store this equipment near the hazardous waste storage areas. Construction vehicles working on the access road, distribution line, and transmission system shall be equipped with spill response kits. The construction contractor shall identify the worst-case and most likely spill scenarios, and shall provide spill response equipment adequate to respond to these scenarios. As part of the Emergency Release Response Form (Appendix C) submitted to SCE's Safety Environmental Specialist (SES), the construction contractor shall provide a description of the spill response equipment that will be available on site. The location of the spill response equipment at the substation and telecommunication sites will be identified on site maps and communicated to construction personnel during training. The construction contractor shall be responsible for maintaining a current inventory of spill response equipment and for regularly inspecting and servicing equipment per manufacturer's recommendations. Oil-absorbent material, tarps, storage drums, and shovels used to contain and control minor releases shall be easily accessible at designated location(s) under active construction throughout the project area. Personal protective equipment, including gloves, boots, safety glasses, and Tyvek® suits, shall be available on site. In addition, fire extinguishers and first aid kits shall be easily accessible at designated location(s) throughout the project area. Because the major source of hazardous waste on site will be from releases of hazardous material during construction, the number of large spill kits will be adjusted according to the number of construction crews working in an area and the remoteness of the area where a particular crew may be located.

2.2.5 Hazardous Materials Business Plan

An HMBP details the handling and release or threatened release of hazardous materials. The information provided by an HMBP is necessary to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of hazardous materials into the workplace and environment. Basic information on the location (GPS coordinates), type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in California, which could be accidently released into the environment, must be available to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested persons. These regulations are covered under CHSC Chapter 6.95, Article 1 - Hazardous Materials Release Response and Inventory Program (Sections 25500-25520) and Article 2 - Hazardous Materials Management (Sections 25531-25543.3).

An HMBP is needed if a business uses, handles, or stores a hazardous material or an extremely hazardous material in quantities greater than or equal to the following (CCR Title 19):

- 500 pounds of a solid substance,
- 55 gallons of a liquid,
- 200 cubic feet of compressed gas,
- Hazardous compressed gas in any amount, and
- Hazardous waste in any quantity.

The EITP may meet the criteria described above during construction. If needed, an HMBP will be prepared in accordance with CHSC Chapter 6.95, and CCR Title 22, Social Security, Division 4.5,. The HMBP will include hazardous materials and hazardous waste management procedures and emergency response procedures including emergency spill cleanup supplies and equipment. SCE or its construction contractor will prepare the HMBP and submit it to the applicable CUPA prior to exceeding the CCR Title 19 thresholds listed above. The HMBP will be a separate document from this plan.

2.3 APM-W-2 Erosion Control and Hazardous Material Handling

Erosion control and hazardous material plans are being provided as a separate document. The document will provide procedures for identifying, assessing, excavating, storing, sampling, and disposing of impacted soil or material encountered during construction activities. Erosion control and hazardous material handling will be consistent with BMPs.

2.4 APM-W-10: Emergency Response Procedures

Emergency response procedures provide guidance for personnel to respond safely and quickly to emergencies to prevent adverse impact to human health or impact to surrounding environmental media. Emergency response procedures will be developed and implemented by SCE and the construction contractor for the EITP and will include identification of roles, responsibilities, standards for notification, internal and external reporting, as well as documentation required. Project personnel will be trained on and will follow the emergency response procedures for the EITP. The emergency response chain of command and procedures will be documented and provided to project personnel. Emergency contacts areKirk Riehl SCE Construction Manager (714) 814-5643 , and Wayne Williams, SES (909-615-8527).

2.5 APM-W-12 Properly Dispose of Hazardous Waste

2.5.1 Hazardous Waste

Typical hazardous waste that could be generated during construction activities are spent solvents, waste lubricants, and spent oil-absorbent materials, and fuel. Hazardous waste typically will be generated and properly stored at "remote sites" during construction. Accumulation and storage shall be performed in a manner consistent with the requirements set forth in NRS Chapter 459.400-856 and CCR Title 22, Division 4.5. A remote site is one where hazardous waste is generated, but is not routinely staffed and is not adjacent or connected to a staffed project site. Waste from remote sites shall be properly transported to a consolidation site authorized to accept the specific hazardous waste in accordance with the applicable portions of CHSC Sections 25110.10 through 25169 and NRS 459.450 through NRS 459.780.

2.5.2 Hazardous Waste Storage

All wastes will be handled in a safe and environmentally sound manner. Hazardous waste will be stored at "remote sites" during construction. A remote site is one where hazardous waste is

generated or stored, but is not routinely staffed and is not adjacent or connected to a staffed project site. Waste from remote sites shall be transported to a consolidation site in accordance with the applicable portions of CHSC Section 25110.10 through 25160-25169 and NRS 459.450 through 459.780. As part of the Emergency Release Response Form (Appendix C) submitted to SCE's SES (Wayne Williams or his alternate Carey Hull), the construction contractor shall provide the location of both remote sites and the consolidation sites on project site maps.

2.5.3 Containment and Labeling

Hazardous waste accumulated and stored on site during construction shall be managed by the construction contractor in accordance with local, state, and federal guidelines. All hazardous material and hazardous waste that will remain on site overnight shall be stored in clearly labeled containers in clearly identified and secure areas, and incompatible wastes shall be segregated. All hazardous waste containers shall remain closed unless waste is actively added or removed from the container, so that hazardous wastes are not in contact with precipitation or runoff. Construction personnel who manage hazardous waste should be trained in Hazardous Waste Operations and Emergency Response. These personnel shall be responsible for complying with federal, state, and local requirements, including applicable permits, laws, and ordinances related to hazardous materials and hazardous waste management.

2.6 MM-HAZ-4 Disposal of Demolition Materials

Any demolition waste deemed hazardous due to presence of hazardous chemicals shall be handled in accordance with guidelines presented in Section 2.1.2 and Section 2.5.

2.7 MM-HAZ-5 Backfill Materials

Importing fill material is not anticipated to be necessary for the EITP. However, in order to minimize the potential of introducing contaminated fill material onto the site, the contractor shall verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. Any such documentation should be signed by an appropriately state licensed and/or registered individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use. Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the Department of Toxic Substances Control Preliminary Endangerment Assessment Guidance Manual for California and EPA guidance for Nevada.

2.8 EPA Identification Number

The Resource Conservation and Recovery Act (RCRA) requires individuals who generate or transport hazardous waste, or who operate a facility for recycling, treating, storing, or disposing of hazardous waste, to notify EPA or their authorized State waste management agency of their regulated waste activities and obtain a US EPA Identification Number (also known as a RCRA Identification Number). Prior to construction, SCE will submit the Notification of Regulated Waste Activity (EPA Form 8700-12) and obtain an EPA identification number. SCE will also obtain a California Waste identification number (Department of Toxic Substances Control Form 1358) as required by the California Department of Toxic Substance Control.

3.0 Plan Approval

This Plan has been prepared to address the requirements of APM-HAZ-2, APM-HAZ-5, APM-W-2, APM-W-10, APM-W-12, MM-HAZ-4, MM-HAZ-5, and MM-HAZ-6 as noted. SCE requests review and approval of this Plan from the BLM and CPUC. Upon receipt of the Permit to Construct, this Plan may be amended to reflect the information in the clearance and approval documents.

4.0 References

California Code of Regulations, Title 22. Accessed at http://www.dtsc.ca.gov/LawsRegsPolicies/Title22/. Accessed on August 2011

California Department of Industrial Relations Subchapter 7. General Industry Safety Orders, Group 27. Fire Protection Article 157. Portable Fire Extinguishers (e)(3) September 2011

California Health and Safety Code. Accessed at http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=hsc&codebody=&hits=20. Accessed on August 2011.

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California Storm Water Quality Association, 2004. Industrial and Commercial Handbook. Accessed at http://www.cabmphandbooks.com/Industrial.asp. Accessed on August 2011.

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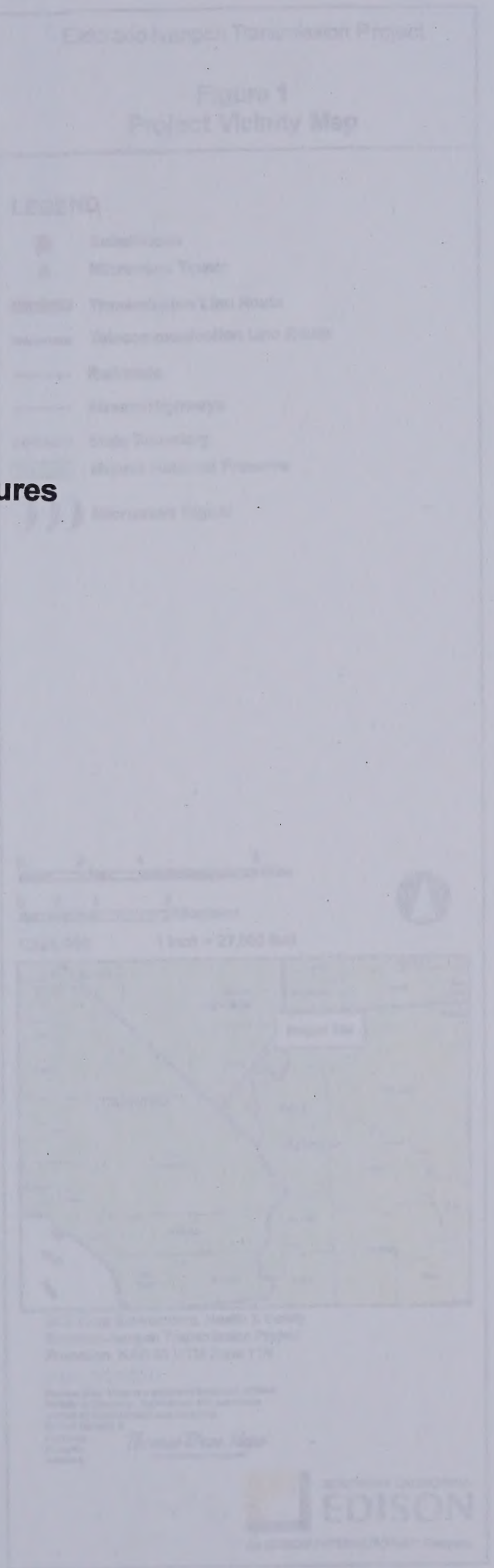
Nevada Department of Environmental Protection- Bureau of Water Pollution.*Control Nevada Contractors Field Guide for Construction Site Best Management Practices (BMPs) June 2008-* Accessed on August 2011.

Nevada Revised Statute NRS- Chapter 459 Hazardous Materials. Accessed at http://www.leg.state.nv.us/nrs/NRS-459.html#NRS459Sec435. Accessed on August 2011.

Figures



Eldorado-Ivanpah Transmission Project

Figure 1
Project Vicinity Map

LEGEND

- Substations
- Microwave Tower
- Transmission Line Route
- Telecommunication Line Route
- Railroads
- Streets/Highways
- State Boundary
- Mojave National Preserve
- Microwave Signal

0 2 4 8 Miles

0 2 4 8 Kilometers

1:324,000 1 inch = 27,000 feet

SCE Corp Environment, Health & Safety
Eldorado-Ivanpah Transmission Project
Projection: NAD 83 UTM Zone 11N
Date: 6/23/2011

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Eldorado-Ivanpah Transmission Project

Figure 2
Project Map

LEGEND

- Substations
- Microwave Tower
- Laydown Yards
- Transmission Line Route
- Telecommunication Line Route
- Railroads
- Streets/Highways
- State Boundary
- Mojave National Preserve
- Microwave Signal

0 2 4 Miles

0 2 4 Kilometers

1:250,000 1 inch = 20,833 feet

SCE Corp Environment, Health & Safety
Eldorado-Ivanpah Transmission Project
Projection: NAD 83 UTM Zone 11N
Date: 3/30/2011

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Appendix A

Hazardous Materials Inventory Form

HAZARDOUS MATERIAL INVENTORY FORM

1. Project: Eldorado Ivanpah Transmission Project	
2. Site Name:	
3. Site Address / Location:	
4. Hazardous Material Information (Complete this form for each hazardous material used or stored on site)	
Hazardous Material Name:	
Hazardous Material Intended Use:	
Is a MSDS Available Onsite? Yes / No: (attach MSDS)	
New Hazardous Material or Quantity Change?	
Quantity Stored Onsite:	
Type of Container:	
Size of Largest Container:	
Location of Hazardous Material on Site (attach Map):	
6. Inventory Prepared By	
Requestor's Name:	Date:
Signature	
Supervisor's Name:	Date:
Signature:	
8. Emergency Notification:	
a. The Contractor is required to comply with State and federal law and the project Hazardous Materials Management Plan when reporting releases or threats of releases of hazardous materials. Describe the internal emergency notification procedure for the site.	
b. In case of emergency, the Contractor shall dial 911 immediately.	
c. The Contractor will contact SCE and the CPUC or BLM Environmental Monitor after emergency service personnel are notified.	
d. Contact the local CUPA, California Emergency Management Agency, and National Response Center as required by State and federal law and the project Hazardous Materials Management Plan.	
9. Emergency Medical Facility	
Facility Name:	Phone:
Address:	
City:	Zip Code:

9. Documentation: The Contractor shall complete the Spill Log/Report Form when a release or threat of release of a hazardous material or waste occurs. The Contractor shall comply with State and federal law and the project Hazardous Materials Management Plan when documenting releases or threats of releases.	
10. Cleanup and Disposal Contractor:	
Name:	Phone:
Address:	
City:	Zip Code:
11. Emergency Equipment: The Contractor shall provide a list of emergency equipment stored at all sites and attach to the Emergency Release Response form.	
12. Site Map/ Storage Map: The Contractor shall attach a detailed site plan to the Emergency Release Response form that designates hazardous material and waste storage, use, dispensing, or handling areas; storm drain and sewer inlets; access points; and names and locations of adjacent streets.	

Appendix B

Spill Log/Report

SPILL LOG REPORT

Contract #:		Project #:
Please circle the appropriate information: INITIAL / FINAL REPORT REPORTABLE / NON-REPORTABLE QUANTITY SPILL		
1. Log Prepared by:		
Name:	Date:	
Email:	Phone:	
2. Location of the Spill		
Address/Tower/GPS:		
City:	State:	Zip Code:
County:	Nearest Road:	
Latitude:	Longitude:	
3. Specific Spill Information:		
Date of Spill:	Time of Spill:	
Material Spilled:		
Quantity Spilled:		
Media Affected (Circle one): Concrete / Asphalt / Water / Vegetation / Soil / Other If other, please specify:		
Source of Spill Info (Equip ID):		
Additional Comments:		
Cause of Spill:		
5. Extent of Spill:		
6. Potential Threat to Surface and/or Groundwater, Human Health (Affect Groundwater/ residential areas, etc.):		
7. Response and Cleanup Action Taken:		
8. Regulatory Notification:		
Date:	Time:	

Individual (First, Last):	Agency:
Phone #:	Purpose/ Comments:
Date:	Time:
Individual (First, Last):	Agency:
Phone #:	Purpose/ Comments:
9. Additional Information:	

Appendix C

Emergency Release Response Form

EMERGENCY RELEASE RESPONSE FORM

1. Project: Eldorado Ivanpah Transmission Project	
2. Site Name:	
3. Site Address / Location:	
4. Prepared By:	
Name:	Date:
Title:	Role:
Email:	Phone:
5. Primary Emergency Contact	
Name:	Title:
Role	Phone:
Responsibilities:	Cellular Phone (24 Hr Contact):
Email address (if applicable):	
6. Secondary Emergency Contact	
Name:	Title:
Role	Phone:
Responsibilities:	Cellular Phone (24 Hr Contact):
Email address (if applicable):	
7. The Contractor shall provide a list of emergency response personnel for the site, in addition to those in the Emergency Contact sections above and attach to the Emergency Release Response form. Include the name, title, role, responsibility, telephone, and email address for each person listed.	
8. Emergency Notification:	
a. The Contractor is required to comply with State and federal law and the project Hazardous Materials Management Plan when reporting releases or threats of releases of hazardous materials. Describe the internal emergency notification procedure for the site.	
b. In case of emergency, the Contractor shall dial 911 immediately.	
c. The Contractor will contact SCE and the CPUC or BLM Environmental Monitor after emergency service personnel are notified.	
d. Contact the local CUPA, California Emergency Management Agency, and National Response Center as required by State and federal law and the project Hazardous Materials Management Plan.	
9. Emergency Medical Facility	
Facility Name:	Phone:
Address:	

City:	Zip Code:
9. Documentation: The Contractor shall complete the Spill Log/Report Form when a release or threat of release of a hazardous material or waste occurs. The Contractor shall comply with State and federal law and the project Hazardous Materials Management Plan when documenting releases or threats of releases.	
10. Cleanup and Disposal Contractor:	
Name:	Phone:
Address:	
City:	Zip Code:
11. Emergency Equipment: The Contractor shall provide a list of emergency equipment stored at the site and attach to the Emergency Release Response form.	
12. Site Map/Storage Map: The Contractor shall attach a detailed site plan to the Emergency Release Response form that designates hazardous material and waste storage, use, dispensing, or handling areas; storm drain and sewer inlets; access points; and names and locations of adjacent streets.	

Appendix D

List of Regional Water Quality Control Board-Certified Treated Wood Waste Landfills

FACILITY NAME	COUNTY	FACILITY'S SITE ADDRESS	CITY	ZIP CODE	FACILITY'S CONTACT NUMBER
Altamont Landfill and Resource Recovery Facility	Alameda	10840 Altamont Pass Road	Livermore	94551	(800)449-6349
Rock Creek Solid Waste Facility	Calaveras	12021 Hunt Road	Milton	95230	(209)754-6402
Keller Canyon Landfill	Contra Costa	901 Bailey Road	Pittsburg	94565	(925)625-4711
American Avenue Disposal Site	Fresno	18950 W American Avenue	Kerman	93630	(559)846-6138
Allied Imperial Landfill	Imperial	104 East Robinson Road	Imperial	92251	(760)355-0004
Clean Harbors, Buttonwillow, LLC	Kern	2500 W. Lokern Road	Buttonwillow	93206	(805)208-8518
Metropolitan Bakersfield (Bena) Sanitary Landfill	Kern	2951 Neumarkel Road	Caliente	93518	(661)862-8900
Waste Management Inc. McKittrick Site	Kern	56533 Highway 58 West	McKittrick	93251	(661)762-7366
CWMI Kettleman Hills Facility	Kings	35251 Old Skyline Road	Kettleman City	93239	(559)386-9711
Eastlake Sanitary Landfill	Lake	16015 Davis Ave	Clearlake	95422	(707)994-5888
Burbank Landfill (Stough Park)	Los Angeles	1600 N. Bel Aire Drive	Burbank	91504	(818)238-3915
Puente Hills Landfill #6	Los Angeles	13130 Crossroads Parkway South	Industry	91746	(562)699-7411
Sunshine Canyon Sanitary Landfill County Extension	Los Angeles	14747 San Fernando Road	Sylmar	91342	(818-833-6513
Chiquita Canyon Landfill	Los Angeles	29201 Henry Mayo Drive	Valencia (In Santa Clarita)	91355	(661)257-3655
Calabasas Sanitary Landfill	Los Angeles	2800 S. Workman Mill Road	Whittier	90601	(562)699-6028 x6005
Savage Canyon Landfill	Los Angeles	13919 East Penn Street	Whittier	90602	(562)907-7750
Johnson Canyon Sanitary Landfill	Monterey	31400 Johnson Canyon Road	Gonzales	93926	(831)675-2165

FACILITY NAME	COUNTY	FACILITY'S SITE ADDRESS	CITY	ZIP CODE	FACILITY'S CONTACT NUMBER
MRWMD Monterey Peninsula Landfill/Marina	Monterey	14201 Del Monte Boulevard	Marina	93933	(831)384-5313
Crazy Horse Sanitary Landfill	Monterey	350 Crazy Horse Canyon Road	Salinas	93907	(831)663-2796
Clover Flat Landfill	Napa	4380 Clover Flat Road	Calistoga	94515	(707)942-4473
Prima Deshecha Sanitary Landfill	Orange	32250 La Pata Avenue	San Juan Capistrano	92675	(714)834-4000
Western Regional Landfill	Placer	3195 Athens Road Ap #17-060-02	Lincoln	95648	(916)543-3960
Lamb Canyon Sanitary Landfill	Riverside	16411 Lamb Canyon Road	Beaumont	92223	(951)486-3200 County
Badlands Sanitary Landfill	Riverside	31125 Ironwood Avenue	Moreno Valley	92553	(951)486-3200 County
Sacramento County Landfill (Kiefer)	Sacramento	12701 Kiefer Boulevard	Sloughhouse	95683	(916)875-5555 County
Mid-Valley Sanitary Landfill	San Bernadino	2390 N. C31Alder Avenue	Rialto	92377	(800)722-8004 x 2
West Miramar Landfill	San Diego	5180 Convoy Street	San Diego	92111	(858)492-6100
Otay Landfill	San Diego	1700 Maxwell Road	Chula Vista	91911	(619)449-4053
Ramona Landfill	San Diego	20630 Pamo Road	Ramona	92065	(760)789-3410
Forward Inc.	San Joaquin	9999 S. Austin Road	Manteca	95336	(800)204-4242
Cold Canyon Landfill Solid Waste Disposal Site	San Luis Obispo	2268 Carpenter Canyon Road	San Luis Obispo	93401	(805)549-8363
Chicago Grade Landfill	San Luis Obispo	2290 Homestead Road	Templeton	93465	(805)466-2985
Santa Maria Landfill	Santa Barbara	2065 East Main Street	Santa Maria	93454	(805)925-0951x7270
Newby Island Landfill	Santa Clara	1601 Dixon Landing Road	Milpitas(SJ)	95035	(408)262-1401
Kirby Canyon Recycling and Disposal Facility	Santa Clara	910 Coyote Creek Golf Drive	Morgan Hill	95038	(408)779-2206
Guadalupe Rubbish Disposal Company	Santa Clara	15999 Guadalupe Mines Road	San Jose	95120	(408)268-1670

FACILITY NAME	COUNTY	FACILITY'S SITE ADDRESS	CITY	ZIP CODE	FACILITY'S CONTACT NUMBER
Santa Cruz Class III Landfill	Santa Cruz	605 Dimeo Lane	Santa Cruz	95060	(831)420-5160
Buena Vista Drive Sanitary Landfill	Santa Cruz	1231 Bruena Vista Drive	Watsonville	95076	(831)454-2430
City of Watsonville Landfill	Santa Cruz	730 San Andreas Road	Watsonville	95076	(831)768-3131 City
Anderson Landfill	Shasta	Approx. 1/4 mile northwest of W. Anderson Drive	Anderson	9600	(916)378-6637
West Central Landfill	Shasta	14095 Clear Creek Road	Igo	96047	(530)396-2555
Hay Road Landfill	Solano	6426 Hay Road; 1/4 Mile W. Hwy 113	Vacaville	95687	(707)678-4718
Fink Road Landfill	Stanislaus	4000 Fink Road	Crows Landing	95313	(209)837-4800
Toland Road Sanitary Landfill	Ventura	3500 North Toland Road	Santa Paula	93060	(805)658-4674
Simi Valley Landfill & Recycling Center	Ventura	2801 Madera Road	Simi Valley	93065	(805)522-7023
Ostrom Road Landfill	Yuba	5900 Ostrom Road	Wheatland	95692	(530)743-6321
Bradley Landfill West and West Extension III Los Angeles*					
Highway 59 Disposal Site III Merced*					
Ox Mountain (Corinda Los Trancos) Landfill*					
*On Regional Water Quality Control Board list, but the facilities do not accept Treated Wood Waste.					

Eldorado-Ivanpah Transmission Project

Soil Management Plan

Eldorado-Ivanpah Transmission Project

Soil Management Plan

Prepared for:

Southern California Edison

October 2011

Prepared by:

AECOM

Applicant Proposed Measures Covered:

APM-HAZ-3 Soil Management Plan

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List of Acronyms

APM	Applicant Proposed Measure
BCA	Bureau of Corrective Actions
BLM	Bureau of Land Management
BMP	best management practice
CCR	California Code of Regulations
CEH&S	Corporate Environmental Health & Safety
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CM	construction manager
CPUC	California Public Utilities Commission
CUPA	Certified Unified Program Agencies
FEIR/EIS	Final Environmental Impact Report/Environmental Impact Statement
EITP	Eldorado-Ivanpah Transmission Project
EPA	Environmental Protection Agency
kV	kilovolt
MM	Mitigation Measures
NDEP	Nevada Department of Environmental Protection
NEPA	National Environmental Policy Act
NRS	Nevada Revised Statutes
OSHA	Occupational Safety and Health Administration
OE	Owner's Engineer
PUCN	Public Utilities Commission of Nevada
REC	Recognized Environmental Concern
RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison
SCAQMD	South Coast Air Quality Management District
SME	Subject Matter Experts
SVOC	semi volatile organic compound
SWRCB	State Water Resources Control Board
TCLP	toxicity characteristic leaching potential
TPH	total petroleum hydrocarbons
TSDF	treatment, storage and/or disposal facility

VOC	volatile organic compound

1.0 Introduction

This Soil Management Plan (Plan) for the construction phases of Southern California Edison's (SCE) Eldorado-Ivanpah Transmission Project (EITP) presents the activities that support compliance with the Applicant Proposed Measure (APM) listed in Table 1. Compliance with the APM will provide guidance for the proper handling, on-site management, and disposal of impacted soil that might be encountered during construction activities. This Plan provides guidelines for impacted soil identification, impacted soil assessment, soil excavation, impacted soil storage, verification sampling, and impacted soil characterization and disposal.

1.1 Project Overview

SCE will construct the EITP transmission line, which will provide electrical transmission infrastructure to deliver new renewable generation from the Ivanpah Valley area to the California Independent System Operator grid. The EITP will consist of a new bundled double-circuit 220-kilovolt (kV) electric transmission line, which will replace the existing 115-kV transmission line, including the telecommunication system. Other components of the EITP include upgrades to the Eldorado Substation and construction of the new Ivanpah Substation. The transmission line will extend approximately 35 miles from the existing Eldorado Substation, located 14 miles from Boulder City, Nevada, to the proposed Ivanpah Substation in California, located near Primm, Nevada (See Figures 1 and 2 for EITP Vicinity and Project Map). The EITP will consist of the work described in the following paragraphs.

Eldorado–Ivanpah 220-kV Transmission Line – A new bundled double-circuit 220-kV transmission line will be constructed between the existing Eldorado Substation and the new Ivanpah Substation. It will replace a portion of the existing 115-kV transmission line that runs from Eldorado Substation to Mountain Pass Substation, through Baker, Dunn Siding, and Cool Water substations. The existing 115-kV transmission line that runs west of the proposed Ivanpah Substation to Mountain Pass Substation will remain unchanged and is not part of the EITP.

Sub-transmission Line – A new 600- to 800-foot-long addition to an existing 115-kV sub-transmission line will connect the remaining portion of the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass line to the proposed Ivanpah Substation.

Distribution Lines – A new 33-kV distribution line will be installed to provide reliable lighting and power service to the new Ivanpah Substation. This component will consist of approximately 1 mile of new underground 33-kV circuitry and two new Remote Control Switches that will be installed adjacent to Densmore Drive at the California state line near Primm, Nevada. One of the switches will be located south of the Ivanpah Substation and the second will be located next to the Primm Valley Golf Club's Desert Course. In addition, approximately 4,300 feet of a new 33-kV overhead line will be installed between the town of Nipton and the new microwave site proposed to be located northeast of Nipton.

Ivanpah Substation – The proposed Ivanpah Substation will be located in California near Primm, Nevada, and will serve as a connector hub for solar energy generated in the Ivanpah Valley area. The substation will include a mechanical and electrical equipment room and a microwave tower.

Eldorado Substation – Changes inside the existing Eldorado Substation will be made to accommodate the new Eldorado–Ivanpah 220-kV transmission line.

Telecommunication System – An existing overhead ground wire will be replaced with an optical ground wire on an approximately 25-mile section of the existing Eldorado–Lugo 500-kV transmission line. A 4.8-mile-long underground duct from the Eldorado–Lugo 500-kV transmission line to a proposed microwave telecommunications site in Nipton, California, will be installed. This microwave telecommunication site will consist of a communication building, a microwave tower, and an emergency generator. A microwave connection will be developed by installing two 180-foot-tall communication towers, one at the new Nipton microwave yard located northeast of Nipton and the other at the proposed Ivanpah Substation. A communications room will be installed in the mechanical and electrical equipment room at the Ivanpah Substation to house communication equipment. Telecommunication equipment will also be installed at the Eldorado Substation. For the early interconnect phase of the EITP, one additional fiber optic path will be required to connect the new facilities at Ivanpah to the local telecom carrier at Mountain Pass. This will require the installation of approximately 8 miles of All Dielectric Self Supporting fiber optic cable on the existing transmission structures.

1.2 Lead Agencies

Lead agencies have discretionary approval over the EITP and are responsible for reviewing aspects of the measures documented in this Plan. The U.S. Department of the Interior, Bureau of Land Management (BLM) is the federal lead agency responsible for compliance with the National Environmental Policy Act (NEPA). NEPA analysis was required as a result of BLM's decision making responsibility for a right-of-way application and to facilitate its decision to issue a permit to construct. The California Public Utilities Commission (CPUC) has discretionary authority to issue a Certificate of Public Convenience and Necessity for the EITP. As allowed by the California Environmental Quality Act (CEQA) Guidelines Section 15221, the CPUC used the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) (CPUC/BLM 2010) to provide the environmental review required under CEQA for their approval of the relevant portions of the EITP. The Public Utilities Commission of Nevada (PUCN) has the authority to issue a permit to construct for the portions of the EITP facilities constructed in Nevada. As allowed by the Nevada Utility Regulations, Chapter 704 – (Nevada Revised Statutes [NRS] 704.877) the PUCN has a duty to accept and incorporate findings and conclusions of environmental reviews that have already been conducted by an appropriate federal agency or by a state, regional or local agency. Further the PUCN will cooperate with other permitting agencies and the appropriate federal agencies on applications for permits, licenses and other approvals to construct a utility facility and coordinate their activities, including, without limitation, conducting hearings or environmental reviews to avoid duplication of activities.

1.3 Applicant Proposed Measures & Mitigation Measures

The APM addressed in this Plan is listed in Table 1. Mitigation Measure (MM) HAZ-3 requires agency coordination and approvals before initiating the Phase I Environmental Site Assessment, site investigation under the Soil Management Plan, and/or any remediation work. The requirements for the agency coordination and approvals have been incorporated into this Plan to facilitate the accessibility of the information for workers. Therefore, MM-HAZ-3 is not further discussed.

Table 1 Applicant Proposed Measures & Mitigation Measures

Measure	Description
APM-HAZ-3	**Soil Management Plan.** A Soil Management Plan will be developed and implemented for construction of the EITP. The objective of the Soil Management Plan is to provide guidance for the proper handling, on-site management, and disposal of impacted soil that might be encountered during construction activities. The Plan will include practices that are consistent with the California Title 8, Occupational Health

Table 1 Applicant Proposed Measures & Mitigation Measures

Measure	Description
	and Safety Administration (OSHA) regulations, as well as appropriate remediation standards that are protective of the planned use. Appropriately trained professionals will be on site during preparation, grading, and related earthwork activities to monitor soil conditions encountered. The Soil Management Plan will provide guidelines for the following: • Impacted soil identification, • Impacted soil assessment, • Soil excavation, • Impacted soil storage, • Verification sampling, and • Impacted soil characterization and disposal. In the event that potentially contaminated soils are encountered within the footprint of construction, soils will be tested and stockpiled. In California, the Certified Unified Program Agencies (CUPA) will determine whether further assessment is warranted. In Nevada, the Nevada Department of Environmental Protection (NDEP) Bureau of Corrective Actions (BCA) Spill Hotline (888-331-6337) will be contacted if the quantity of impacted material is greater than 3 cubic yards
The Storm Water Pollution Prevention Plan, Hazardous Material and Hazardous Waste Handling Plan, Hazardous Materials Business Plan, and Spill Prevention, Control and Countermeasure Plan are separate plans and are not included in this Soil Management Plan.	

1.4 Applicable Activities and Project Areas

The activities addressed in this Plan include identifying, assessing, excavating, storing, sampling, and disposing of impacted soil or water. This Plan is applicable to all SCE components of the construction activities on the transmission line path between the Eldorado and Ivanpah substations.

1.5 Timing

The APM described in this Plan is applicable for the following periods of the EITP, as shown in Table 2.

Table 2 Timing of Applicant Proposed Measures Applicability

Applicant Proposed Measure/ Mitigation Measure	Description	Period	
		Construction	Post-Construction
APM-HAZ-3	Soil Management Plan	✓	✓

1.6 General Provisions

Through use of this Plan, and the Health and Safety Plan where appropriate, SCE/Owner's Engineer (OE) and its subcontractors will have the necessary means and methods to detect potentially

contaminated conditions, protect worker safety, protect the public and the environment, inform the SCE/OE Environmental Coordinator of the discovery of such conditions, and properly handle and dispose of contaminated materials. SCE will excavate and stockpile suspect contaminated media from other areas of the site and will conduct sampling and manage disposal of these materials. SCE will also properly decontaminate equipment that has been in contact with contaminated or potentially contaminated material. These provisions are intended to describe minimum levels of precautions required to meet SCE requirements.

The construction contractor will be solely responsible for all matters related to worker health and safety and for detection of contaminated materials encountered during the construction as they relate to worker safety and environmental protection. The construction contractor will ensure the protection of the safety and health of construction workers and other authorized persons at the work site from exposure to potentially toxic materials. The construction contractor will also assess the site to identify potential hazards for workers.

Material to be excavated, graded, treated and/or removed will be handled and stored in a manner that prevents the spread of contamination to adjacent soil or water, minimizes the generation of dust, and is compliant with all applicable federal, state and local rules and regulations including but not limited to South Coast Air Quality Management District (SCAQMD) Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. SCE or SCE subcontractors will control visible dust from leaving the construction area and comply with all local air quality rules and regulations for dust control including but not limited to SCAQMD Rule 403 – Fugitive Dust, and Clark County, Nevada, Department of Air Quality and Environmental Management Sections 41, 91 and 92 Fugitive Dust regulations for construction activities.

2.0 APM-HAZ-3 Soil Management Plan

This section includes a detailed description of the actions required to implement the applicable APM for the EITP. The FEIR/EIS does not identify any portion of the project area as a Recognizable Environmental Concern (REC). However, unexpected RECs may be encountered during construction. The following sections of this Plan include descriptions of the actions required to comply with the APM required by the FEIR/EIS, as well as the responsibilities and coordination required between SCE and the construction contractor to implement such actions.

This section of the Plan also provides guidance regarding identification, management, characterization, and disposal of contaminated or potentially contaminated media (e.g. debris, excavated soil) from the project area. Recommended decontamination procedures are also discussed.

The construction contractor shall be responsible for complying with federal, state, and local requirements for the handling, storage, transport, and disposal of hazardous materials and hazardous waste, as well as nonhazardous construction waste. The construction contractor shall be responsible for implementing the performance requirements identified in this Plan.

The construction contractor personnel who is responsible for handling hazardous materials and waste for the EITP shall be trained in accordance with the requirements set forth in California Code of Regulations (CCR) Title 22, Division 4.5 (Environmental Health Standards for the Management of Hazardous Waste) and NRS Chapter 459 (Hazardous Materials) regarding the proper use and management of these materials, and shall be familiar with applicable laws, policies, procedures, and best management practices (BMPs). Spill response personnel will be trained to work with hazardous materials and will be familiar with the construction contractor's emergency response procedures. SCE personnel that visit or work on the construction site will also be familiar with and follow these applicable requirements. All construction personnel will be responsible for complying with federal, state, and local requirements, including applicable permits, laws, and ordinances related to hazardous materials and hazardous waste management.

2.1 Identification and Management of Potentially Contaminated Soils

Materials that exhibit the following characteristics will initially be identified as potentially contaminated, pending further evaluation, by the construction contractor and will be reported to SCE:

- Materials that exhibit unusual staining (e.g. grayish green or black).
- Materials that exhibit an unusual odor.
- Materials that create a sheen when placed in water.
- Materials in the presence of drums or containers of unknown origin.

If potentially contaminated materials are encountered in the footprint of the project area along the transmission right-of-way, the construction contractor will:

1. Stop work in the area.
2. Immediately notify the SCE Environmental Coordinator, the construction contractor superintendent and the construction contractor environmental staff.

3. Excavate and segregate potentially contaminated material within the footprint of SCE activities and place in either a lined container or in a stockpile that will be lined and covered until further analysis has been performed. Ensure no contaminated material is hauled from the site prior to sampling and analysis.

4. Secure the area until notified by the SCE Environmental Coordinator that work may continue in accordance with the construction contractor-specified and SCE-approved procedures. The construction contractor will be responsible for removing staff from the immediate area of potential contamination and will leave all machinery and equipment that has come in direct contact with potentially contaminated media. The construction contractor may move its operations and unaffected equipment to another portion of the site.

If potentially contaminated materials are encountered on the SCE right-of-way, the construction contractor will:

1. Stop work in the area.

2. Immediately notify the SCE Environmental Coordinator, the OE/Construction Manager (CM), the superintendent and the construction contractor environmental staff.

3. Secure the area until notified by the SCE Environmental Coordinator that work may continue in accordance with the construction contractor-specified and SCE-approved procedures. The construction contractor will be responsible for removing staff from the immediate area of potential contamination and will leave all machinery and equipment that has come in direct contact with potentially contaminated media. The construction contractor may move its operations and unaffected equipment to another portion of the site.

4. Assess potentially contaminated material by verification sampling.

5. Notify and coordinate with appropriate agency for oversight and submittal of work plan to address cleanup of contaminated materials.

6. Proceed as directed by lead cleanup agency.

2.2 Assessment of Potentially Contaminated Soils

1. SCE or their representative will obtain samples of suspected contaminated materials. Per the mitigation measures outlined in SCE's Environmental Contamination and Hazards section of contractor requirements, sampling personnel will be OSHA-trained with a minimum of 40-hour Hazardous Waste Operations and Emergency Response worker training. Samples will be delivered to a California-approved laboratory under appropriate chain of custody for analysis. If the location of the soil is in Nevada, samples will be delivered to a Nevada-approved laboratory under appropriate chain of custody for analysis.

   a. For purposes of screening soil and groundwater, Environmental Protection Agency (EPA) Regional Screening Levels may be used. It is important to note, however, that these levels are to be used for screening purposes only. The construction contractor will coordinate with SCE's Environmental Coordinator (Environmental Coordinator will work with SCE's Corporate Environment, Health & Safety [CEH&S] Water/Waste Division representatives; Wayne Williams and John Johnson) to determine if soil and/or groundwater analyses indicate contamination, and to determine whether or not special handling and/or disposal will be required.

2. If material is determined to be contaminated, the construction contractor will manage contaminated materials in compliance with the appropriate local, state, and federal regulations. The construction contractor will contact the SCE Environmental Coordinator and representatives from CEH&S for assistance with, or concurrence with the waste classification. Analytical reports shall be forwarded to the following individuals:

   a. Wayne Williams at wayne.williams@sce.com.

   b. John R. Johnsen at john.johnsen@sce.com

   c. Mark Passarini at mark.passarini@sce.com

3. A copy of the analytical results shall also be sent to the OE.

4. Concurrence regarding proper waste characterization shall be provided by a representative of CEH&S Water/Waste Division, Hazardous Waste Section. The primary contact will be John R. Johnsen at (626)302-1439 or (626)756-6403. If Mr. Johnsen is not available, Sara Duvall may be contacted at (626)302-4187 or at (626)862-8458. If neither can be reached, Joe Spambersky may be contacted at the main number (626)302-1212.

5. If the waste is determined to be hazardous or industrial waste requiring off-site disposal, SCE will hire a third-party contractor trained in hazardous waste removal and disposal to load containers using practices that will prevent spilling or tracking of hazardous media. They will also be responsible for transporting the hazardous material to an SCE-approved facility for disposal.

6. If soils are deemed to be clean, the construction contractor will move and reuse/backfill clean materials on site as necessary. If there is excess soil for use in the immediate vicinity, the construction contractor may either transport the soil to a location where fill soil is needed or distribute the remaining soil evenly over the work area.

7. The procedures to be used to resume the work will depend on the nature and extent of the potentially contaminated material encountered. Subject to approval of the SCE Environmental Coordinator, the following alternate methods of operation for resuming work may be generally used:

   a. The construction contractor may resume work as before the work suspension.

   b. The construction contractor may move its operations to another portion of the site until measures to eliminate any hazardous conditions are developed and approved.

2.3 Soil Excavation

The construction contractor will handle and segregate clean and suspected contaminated soils separately encountered in the footprint of the construction. Suspect or contaminated media removed as part of the installation of SCE facilities will require special handling and disposal. The construction contractor will excavate materials in a manner that prevents contaminants from spreading into uncontaminated areas. The construction contractor will minimize or eliminate the movement of excavation equipment over or through contaminated soil. Known and suspected contaminated materials will either be placed in dump trucks or roll-off containers. Clean materials may be stockpiled on site.

All work performed within the SCAQMD jurisdiction shall be conducted in accordance will all applicable provisions of SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. Note that SCAQMD Rule 1166 applies to volatile organic compound- (VOC) contaminated soil, which is a soil that registers a concentration of 50 parts per million or greater of VOCs as measured before suppression materials have been applied and at a distance of no more than 3 inches from the surface of the excavated soil with an organic vapor analyzer calibrated with hexane.

2.4 Impacted Soil Storage

Suspect or potentially contaminated materials will be stockpiled by placing the excavated soil on plastic sheeting material and covering with plastic sheeting while awaiting chemical analysis and profiling. Alternatively, suspect or potentially contaminated soil may be placed in containers such as lined bins or drums while awaiting chemical analysis and profiling. BMPs consistent with current storm water permit requirements (in California the Construction General Permit State Water Resource Control Board [SWRCB] Order No. 2009-0009-DWQ and in Nevada the Construction Stormwater Permit No. NVR100000) will be employed to prevent contaminated media from entering stormwater and potentially leaving the site. An impervious material, such as visqueen, will be used to prevent segregated and stockpiled materials from coming into contact with the ground.

- The construction contractor will place materials that are known or suspected to be contaminated in containers or will stockpile materials at locations suggested by the construction contractor and approved by SCE/OE/CM.
- Containers and stockpiles will be lined and covered when not being filled. Stockpile areas will be covered when not in use to eliminate contact with precipitation. Free liquids in containers or draining from stockpiles will be controlled and contained by the construction contractor and will not be released to the environment.
- The construction contractor will provide berms to prevent surface or stormwater from entering stockpiles.
- The construction contractor will minimize the water content of any excavated soils by using the above methods prior to placement of soil in containers or stockpiles in order to maximize control of free liquids to prevent releases to the environment.
- The construction contractor will provide suitable barricades, fencing, signing and other warning and safety devices to protect the public and other site workers from stockpiles, contaminated materials, open excavations, heavy equipment, and other construction activities.
- For materials known or suspected of being hazardous, the construction contractor or their representative will meet the labeling and signage requirements of CCR Title 22 and Code of Federal Regulations (CFR) Titles 40 and 49.
- All stockpiles of contaminated material will be removed from the site for final disposal within 90 days following excavation.
- Following removal of stockpile materials, stockpile areas and container storage areas will be returned to pre-construction conditions.

2.5 Agency Coordination (MM-HAZ-3)

If assessment activities determine that contaminated soil has been encountered in the SCE right-of-way, agency oversight will be required to determine if all contaminated soil has been removed and that the remaining soil may remain in place. In California, the CUPA will determine whether further

assessment is warranted. In Nevada, the NDEP BCA Spill Hotline (888-331-6337) will be contacted if the quantity of impacted material is greater than 3 cubic yards.

SCE will develop and submit a work plan to the appropriate federal, state, and/or local regulatory authority to oversee hazardous waste investigations or cleanups. No work will begin without approval of the appropriate regulatory authorities. At a minimum the work plan will include:

- Results of soil assessment sampling;
- Locations of the proposed verification samples either identified on a map or by coordinates;
- Procedures for collecting, preserving and transporting the samples using chain-of-custody documentation; and
- Proposed clean up goals consistent with future land use.

The work plan will be prepared by a California Registered Professional Engineer or Geologist if the location is in California or by a Certified Environmental Manager if the location is in Nevada.

Once the work plan is approved by the CUPA or NDEP, SCE/OE/CM will implement the activities as described in the work plan. Once the investigation or remedial activities are completed, SCE will submit results of all analytical reports to the appropriate regulatory authorities in a report that summarizes the sampling results in reference to regulatory standards. SCE will submit all closure certification or remediation approval reports to the appropriate regulatory authorities

2.5.1 Verification Sampling

Samples that are collected as part of an agency-approved work plan are to be collected using gloved (nitrile) hands and containers appropriate to the proposed analytical methods, placed on ice, transported under chain-of-custody procedures, and submitted to the laboratory as soon as possible and within prescribed holding times. Soil and water samples shall be submitted to Calscience Environmental Laboratories, Garden Grove, California, or another SCE-approved laboratory. Calscience Environmental Laboratories is certified both in California and Nevada.

Sample locations should be identified on a map or by coordinates. The location information will be included on the chain-of-custody forms or provided to the SCE representatives along with the analytical results.

The SCE will analyze soil samples according to the current version of the following analytical procedures:

- Landfills – VOCs, semi volatile organic compounds (SVOCs), polychlorinated biphenyls, total petroleum hydrocarbons (TPH) extended range (C8 – C44), and Title 22 Metals by EPA methods 8260 (preserved in accordance with method 5035), 8270, 8082, 8015 and 6010/7141, respectively.
- Agriculture Sites – VOCs, TPH extended range (C8 – C44), and organochlorine pesticides by EPA methods 8260 (preserved in accordance with method 5035), 8015 and 8081.
- Oil wells – TPH extended range (C8 – C44), VOCs, SVOCs and Title 22 Metals by EPA methods 8015, 8260 (preserved in accordance with method 5035), 8270, and 6010/7141, respectively.

Water samples will be analyzed according to the current version of the following analytical procedures:

- Landfills – VOCs, SVOCs, and Title 22 Metals by EPA methods 8260, 8270, and 6010/7141, respectively.
- Agriculture Sites – VOCs and organochlorine pesticides by EPA methods 8260 and 8081.
- Oil wells – TPH extended range (C8 – C44), VOCs, SVOCs and Title 22 Metals by EPA methods 8015, 8260, 8270, and 6010/7141, respectively.

In addition to the aforementioned tests, for non-wastewaters, if the concentration of any metal(s) analyzed exceed the soluble threshold limits concentrations limit by 10 times or greater, the waste extraction test shall be performed on the specific metal(s). If the concentration of any metal(s) analyzed exceed the toxicity characteristic leaching potential (TCLP) limit by 20 times or greater, the TCLP test shall be performed on the specific metal(s).

2.6 Water Management

All water removed from the areas of contamination, including free water that leaches from contaminated or potentially contaminated materials in containers or stockpiles or water that is suspected of being contaminated, will be collected, handled and stored in a manner that prevents the spread of contamination to adjacent soil or water. Appropriate analytical testing will be performed by SCE. Test results will be provided to SCE's CEH&S Water/Waste Division, Hazardous Waste Section and representatives will verify and document appropriate disposal. Per SCE, the APM sampling personnel will be trained in hazardous waste procedures; spill contingencies; waste minimization procedures; and treatment, storage and/or disposal facility (TSDF) training in accordance with OSHA Hazard Communication Standard and CCR Title 22.

Samples will be delivered to a California/Nevada-approved laboratory under appropriate chain of custody for analysis. The construction contractor will coordinate with SCE's Field Contact Representative to determine necessary handling/disposal requirements. The construction contractor will provide SCE with a copy of any hazardous waste manifest with applicable Land Disposal Restriction forms (federal and/or California or Nevada) for signature prior to shipment.

Before any groundwater is discharged to land, the appropriate Subject Matter Experts (SMEs) within SCE must be consulted (primary CEH&S SME is Paul Teensma and the primary Transmission and Distribution Business Unit SME is John Slayton). The California SWRCB and Regional Water Quality Control Boards (RWQCBs) regulate waste discharges to land, subject to the federal Clean Water Act. Discharges to land have the potential to affect water quality of both surface water and groundwater. The California Water Code requires any person discharging (or proposing to discharge) water that could affect the quality of waters of the State to file a report of waste discharge. In California, the Lahontan RWQCB has the authority to issue waivers for some discharges. In Nevada, the NDEP regulates discharges of groundwater to surface water. NDEP has the authority to issue a temporary groundwater discharge permit for a maximum of a 180-day (6-month) period of time. Communications with the SWRCB and RWQCBs and NDEP must be coordinated by the CEH&S Water Quality Section.

2.7 Impacted Material Characterization and Disposal

The construction contractor will maintain separate stockpiles or roll off boxes for known hazardous waste, industrial waste, suspected hazardous waste, and contaminated materials/media. If concentrations of hazardous constituents in the waste do not exhibit any of the characteristics identified in CCR Title 22, Section 66261.20 and are not Resource Conservation and Recovery Act-regulated hazardous waste or Toxic Substances Control Act-regulated waste, the materials may still be restricted from direct landfill or other disposal options. Therefore, consultation with CEH&S representatives shall take place to assure proper management/disposal of the waste material.

The Hazardous Waste contractor shall pack, label, store, handle, transport, and dispose of hazardous material and hazardous waste in compliance with CFR Titles 40 and 49, NRS Chapter 459, 400-856, and CCR Title 22, Division 4.5, and in accordance with United States Department of Transportation, Nevada Department of Transportation, and California Department of Transportation requirements. SCE shall notify the appropriate agencies of any hazardous waste dumped by third parties in the work area. The construction contractor shall document and maintain a record of contact of all agencies notified of hazardous waste dumped by third parties in the work area, and provide copies of these records to SCE's Environmental Coordinator.

The construction contractor shall provide SCE with the names and telephone numbers of persons responsible for the hazardous waste management program. If the construction contractor does not have appropriate personnel, the construction contractor will hire a third-party contractor trained in hazardous waste removal and disposal to load containers using practices that will prevent spilling or tracking of contaminated/hazardous media. They will also be responsible for transporting the contaminated material to an SCE-approved facility for disposal.

SCE will be considered the generator for any contaminated media excavated from the site unless contamination results from an unauthorized release by the contractor, in which case the contractor will be responsible. The construction contractor will provide SCE's CEH&S Water/Waste Division, Hazardous Waste Section with a copy of any hazardous waste manifest with applicable Land Disposal Restriction forms (federal and/or California or Nevada) for signature prior to shipment.

2.8 Decontamination Procedures

The construction contractor and their subcontractors will properly decontaminate all equipment, including hand tools, used in contaminated or potentially contaminated areas. An area of the work site shall be designated as the decontamination zone. Heavy plastic sheeting or similar material shall be placed in this area to prevent contaminants from impacting clean soil or groundwater during decontamination procedures. The material shall be sloped if possible to direct liquids toward a collection area. This will allow for easier capture and disposal of contaminated liquids and will prevent pooling in the center of the decontamination zone. Workers responsible for decontaminating equipment will wear appropriate personal protective equipment, to avoid contact with potential contamination.

Soil that can be easily scraped from equipment and tools shall be scraped into drums or other appropriate containers. Once loose soil is removed, the equipment shall be cleaned with a solution of water and phosphate-free laboratory grade soap such as Liquinox. Equipment shall be rinsed with clean water. As mentioned above, wash and rinse water shall be directed to a collection area and should not be allowed to flow out of the decontamination zone.

Soil and water collected during the decontamination procedure will be sampled by the construction contractor or their representative. Per SCE AMP-HAZ-2 (Hazardous Materials and Waste Handling Management), sampling personnel will be trained in hazardous waste procedures; spill contingencies; waste minimization procedures; and TSDF training in accordance with OSHA Hazard Communication Standard and CCR Title 22. Samples will be delivered to a California or Nevada-approved laboratory (as appropriate for the jurisdiction), depending on where the material originated, under appropriate chain of custody for analysis. Following receipt of analytical results, the construction contractor will coordinate with SCE's Field Contact Representative to determine appropriate disposal procedures.

2.9 Limitations

This Plan was developed based on SCE's current understanding of the EITP and available documentation. This Plan may be modified to reflect changes in site information based on applicable environmental studies or findings.

When a Phase I Environmental Site Assessment is completed and if contamination is discovered, sections will be added to this Plan to specifically address these areas.

3.0 Plan Approval

This Plan has been prepared to address the requirements of APM-HAZ-3 as noted. SCE requests review and approval of this Plan from the BLM and CPUC. Upon receipt of the Permit to Construct, this Plan may be amended to reflect the information in the clearance and approval documents.

4.0 References

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Nevada Revised Statute NRS- Chapter 459 Hazardous Materials. Accessed at http://www.leg.state.nv.us/nrs/NRS-459.html#NRS459Sec435. Accessed in August 2011.

Figures

4.0 References

Eldorado-Ivanpah Transmission Project

Figure 1
Project Vicinity Map

LEGEND

- Substations
- Microwave Tower
- Transmission Line Route
- Telecommunication Line Route
- Railroads
- Streets/Highways
- State Boundary
- Mojave National Preserve
- Microwave Signal

0 2 4 8 Miles

0 2 4 8 Kilometers

1:324,000 1 inch = 27,000 feet

SCE Corp Environment, Health & Safety
Eldorado-Ivanpah Transmission Project
Projection: NAD 83 UTM Zone 11N
Date: 9/29/2011

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Eldorado-Ivanpah Transmission Project

Figure 2
Project Map

LEGEND

- Substations
- Microwave Tower
- Laydown Yards
- Transmission Line Route
- Telecommunication Line Route
- Railroads
- Streets/Highways
- State Boundary
- Mojave National Preserve
- Microwave Signal

0 2 4 Miles

0 2 4 Kilometers

1:250,000 1 inch = 20,833 feet

SCE Corp Environment, Health & Safety
Eldorado-Ivanpah Transmission Project
Projection: NAD 83 UTM Zone 11N
Date: 9/29/2011

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Eldorado-Ivanpah Transmission Project

Transmission Line Project Fire Plan

SOUTHERN CALIFORNIA EDISON COMPANY
Rosemead, California

SPECIFICATION E-2005-104

TRANSMISSION LINE PROJECT FIRE PLAN

February 21, 2006

Approved for Issue:

Reviewed By: Albert Melikian
Responsible Engineer, Edison

Reviewed By: Brian Berkebile
Responsible Engineer, Edison

Approved By: Jerry Amalfitano
Manager, T&D Business Unit

Approved By: Peter L. Hlapcich 3/22/06
Manager, T&D Business Unit

Specifications
and Standards

SOUTHERN CALIFORNIA EDISON COMPANY
Rosemead, California

SPECIFICATION E-2005-104

TRANSMISSION LINE PROJECT FIRE PLAN

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SECTION 1

TRANSMISSION LINE PROJECT FIRE PLAN

1.1 INTENT

A. This specification has been developed for use by Edison and/or Contractor crews to ensure uniform guidelines for prevention, control, and extinguishment of fires are followed during transmission line construction projects. Frequent reference to and compliance with this specification shall result in more consistency and greater fire control during transmission line construction.

B. The intent of this Specification is to provide an overall technical reference for the Work as defined in the Project Specification. However, not all sections of this Specification may be applicable to every Project. The Project Specification shall define the specific Project Job requirements and shall be the master document in regards to this Specification. In all cases where this Specification is in conflict with the Project Specification, the Project Specification shall apply.

C. Deviation from this specification shall not be permitted unless so described in the Project Specification or approved by Edison's Construction Representative.

D. All Working areas shall be maintained in an orderly, safe, clean and neat manner. As Work is completed in any one area, the area shall be promptly cleaned of all trash and surplus material and left in as good or better condition than initially encountered.

1.2 CONFORMANCE TO APPLICABLE CODES AND SAFETY REGULATIONS

A. Construction shall be performed in accordance with all sanitary, safety and building codes; Rules for Overhead Electric Line Construction G.O. 95, Public Utilities Commission, the National Electric Safety Code; and orders, ordinances and regulations that may apply. All work shall be performed in accordance with the Constructor's Safety Policy, OSHA or any other applicable provisions of Federal, State or local safety regulations. All regulations of the Division of Industrial Safety of the applicable state, any other public agency, or insurance policies shall also be complied with.

B. All Work shall be accomplished by compliance to United States Forest Service Fire Plan, California Public Resource Code, Project Specification, this Specification, referenced specifications and standards, permitting constraints and conditions, and governing regulations using proper tools and equipment that are in good Working condition.

C. The Work shall be performed in compliance with the latest version of the following codes and standards as amended to the date of the Project Specification, which are by reference, incorporated herein and made a part of the Project Specification. However, where the Drawings and/or this Specification calls for apparatus, workmanship, construction, etc., in excess of the referenced code requirements, Constructor shall take steps such that the Work shall be provided.

California Public Resource Code (Division 4. Forests, Forestry and Range and Forage Lands) (CPRC)

United States Forest Service Handbook (FSH)

Storm Water Pollution Prevention Plan (SWPPP)

1.3 RESPONSIBILITIES

A. This Specification describes Constructor and Construction Representative's responsibilities. Edison or Constructor's crew may assume these responsibilities as follows:

B. Edison crew that are assigned to construct transmission lines will assume the responsibilities of "Constructor", as described in this specification, or

C. Contractors who are contracted and authorized by Edison to construct transmission lines shall take on the responsibilities of "Constructor", as delineated in this specification.

D. A Construction Representative will be assigned by Southern California Edison.

1.4 SCOPE OF WORK

Constructor shall furnish all supervision, labor, tools, equipment and material necessary to prevent starting any fire, control spread of fires if started, and provide assistance for extinguishing fires started as a result of transmission line construction activities; as specified herein, the Project Specification, and Job Walk Minutes.

1.5 SAFEGUARDS AND CONTROL OF FIRES

A. Constructor shall provide temporary safeguards, walks, rails, guards, construction fences, and suchlike, as required by any ordinances, as directed by the Construction Representative, or as necessary to protect workers, Edison employees, and the public from the time when the Work is begun until it is accepted by Edison. Constructor shall ensure reasonable safeguards have been implemented to prevent any fires from starting.

B. Constructor shall incorporate Best Management Practices to prevent starting any uncontrolled fire, control spread of fires if started, and provide assistance for extinguishing fires started as a result of transmission line construction. Constructor shall be solely responsible to owners or occupants of land for damage of every kind and nature resulting from the Work and activities of Constructor and its crews.

C. In the event of unforeseen damage to any improvement, Constructor shall promptly notify the Construction Representative and the owner of such improvements. Any damaged improvements shall immediately be repaired by Constructor as approved by the owner of such damaged facility. Other damaged property shall be repaired within a reasonable time.

1.6 PRECAUTIONS IN AREAS OF FIRE HAZARDS

A. Constructor shall use every reasonable precaution against starting fires where the work is performed, in whole or in part, in an area covered with flammable dry grass, brush, and trees. Such precautions shall include, but not be limited to, prohibiting smoking on the Jobsite, use of spark arresters on equipment exhaust, and if necessary assigning a Fire Patrolperson whose responsibility shall be solely to monitor the Constructor's fire-prevention activities. The Fire Patrolperson shall be equipped with radio or cell phone communication capability.

B. Constructor shall provide required portable fire fighting equipment, shovels, axes, and other necessary fire fighting equipment at all sites where work is in progress, and with all crews in transit.

C. Constructor shall observe all other precautionary measures that may be ordered by the United States Forest Service (USFS), Division of Forestry of the State where the worksite is located, County Fire Departments, and their authorized representative.

D. Constructor is further advised that during periods of extreme fire hazard due to critical weather conditions, USFS, Division of Forestry of the State where the worksite is located, and County Fire Departments may order Work to be suspended at any time in designated areas.

E. In the event of any uncontrolled fire near the work, and as requested by the Construction Representative, Constructor shall furnish any and all of its forces and equipment to extinguish such fire as directed by the USFS, Division of Forestry of the State where the worksite is located, and County Fire Departments. Under these conditions, Constructor's forces shall operate under the sole jurisdiction of the USFS, Division of Forestry of the State where the worksite is located, and County Fire Departments. Payment for labor and equipment shall be negotiated between the Constructor and the USFS.

1.7 FIRE PLAN REQUIREMENTS FOR US NATIONAL FOREST AREAS

1.7.1 Constructors Responsibilities

A. The provisions set forth in this section of the Project Fire Plan outline the Constructor's responsibility for fire prevention and suppression activities, along with the establishment of a fire attack procedure during transmission line construction projects which take place within U.S. National Forest areas. The "Project Vicinity" is defined as that area which is within and adjacent to the project rights-of-way and work areas, along with all roads used in connection with the construction activities. The provisions set forth in this section of the Project Fire Plan also specify conditions under which construction activities may be curtailed or shut down while within National Forest areas.

B. The terms and conditions of this Project Fire Plan are designed to be in compliance, or exceed the provisions of the U.S Forest Service "Fire Plan for Construction and Service Contracts" dated 04-26-04 and is incorporated in it's entirety herein.

C. The Forest Service may conduct one or more inspections for compliance with this fire plan. The number, timing, and scope of such inspections will be committed at the discretion of the agency employees responsible for contract administration. Such inspections do not relieve the Constructor of responsibility for correcting violations of this fire plan or for fire safety in general.

Constructor (or his designated representative) shall:

1. Abide by the requirements of this Fire Plan,
2. Take all steps necessary to prevent his/her employees, subcontractors and their employees from setting fires,
3. Be responsible for preventing the escape of fires set accidentally as a result of construction activity,
4. Participate in the extinguishing of all fires in the event that they cannot be immediately contained until relieved by a representative of the U.S. Forest Service,
5. Assure that all project fire prevention methods, tools, equipment and fire suppression activities are in accordance with any U.S. Forest Service, State, or local codes, the Project Specification requirements, and as stated herein,
6. Complete the Contractor's Plan Regarding Personnel, Equipment and Organization (See last page this document), and furnish the U.S. Forest Service representative with a copy prior to commencing work in the National Forest Project Vicinity,

7. Advise the responsible U.S Forest Service representative of any changes in personnel, equipment and organization as the changes occur, and

8. Assign a fire patrolperson whose responsibility shall be solely to monitor the Constructor's fire-prevention activities. The fire patrolperson shall be equipped with radio or cell phone communication capability. The fire patrolperson shall perform the project fire patrolperson duties as described herein and any other duties as necessary to ensure that the Constructor is abiding by this specification.

1.7.2 Operating and Construction Guidelines

Prior to commencement of work each day, the Constructor shall obtain the Project Activity Level (PAL) and plan the work accordingly. Constructor shall then, as part of a morning safety tailboard meeting:

- Review fire plan with employees, fire patrolperson, and the Construction Representative;
- Review smoking policy;
- Remind employees to not leave idling vehicles with hot exhaust manifolds on dirt roads with dead combustible vegetation under the vehicle;
- Inspect vehicles and fire fighting equipment daily to ensure equipment is operable and that Fire Plan inspection sheet is still with vehicles;
- Inspect any new vehicles and construction equipment to ensure it is properly equipped with minimum required fire fighting tools and equipment; and
- Keep a detailed daily log which documents locations of all crew and equipment as part of placement in case a fire occurs.

1.7.3 Fire Prevention Measures

1.7.3.1 Permits Required

The Constructor must secure a special written permit from the District Ranger or designated representative before engaging in any of the activities listed below.

- Blasting and Storage of Explosives and Detonators. Explosives Permit is required
- by California Health & Safety Code, Section 12101,
- Burning,
- Air Pollution.(Issued by local State or County Air Pollution Control Districts, as
- applicable.)
- Camp, Lunch and Warming Fires.
- Welding and Cutting.

1.7.3.2 Regulations for Burning

Before setting any fires whatsoever, the Constructor shall notify the Contracting Officer (CO) of his/her intentions. Special care shall be taken to prevent scorching or causing any damage to adjacent structures, trees, and shrubbery. Piles of material to be burned shall be of such size and so placed that during burning no damage shall result to adjacent objects.

1.7.3.3 Smoking and Fire Rules

Smoking shall not be permitted, except in a barren area or in an area cleared to mineral soil at least three feet in diameter. Designated smoking areas shall be assigned by the Constructor. Constructor shall provide closeable airtight and fireproof container designed to contain cigarette butts for designated smoking areas. Constructor shall post signs regarding smoking and fire rules in conspicuous places for all employees to see. Constructor's supervisory personnel shall require compliance with these rules. Under no circumstances shall smoking be permitted while Constructor's employees are operating light or heavy equipment, while commuting to the jobsite from highways, or walking or working in grass and woodlands.

1.7.3.4 Storage and Parking Areas

Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all flammable material for a radius of at least 50 feet. Small mobile or stationary engine sites shall be cleared of flammable material for a radius of at least 15 feet from such engine. The USFS Contracting Officer (CO) shall approve such sites in writing.

1.7.3.5 Welding

Constructor shall confine welding activity to cleared areas having a minimum radius of ten feet measured from place of welding. If welding occurs on the line right of way, a fire patrolperson shall observe the operation.

1.7.3.6 Blasting

Constructor shall use electric caps only. When blasting is necessary in slash areas, a watchperson equipped with shovel and a water-filled backpack can (5 gallon), with hand pump, shall remain in the immediate area for an hour after blasting has been completed.

1.7.3.7 Oil Filter and Glass Jugs

Constructor shall remove from National Forest land all oily rags and used oil filters. Constructor shall prohibit his/her employees using glass bottles and jugs in National Forests.

1.7.4 Fire Fighting and Reporting Tools and Equipment

Constructor shall provide the Fire Fighting tools and equipment as listed below. All tools and equipment shall be in good workable condition and shall meet the following principle Forest Service specifications for fire tools:

- Shovels shall be size "O" or larger and be not less than 46 inches in overall length.
- Axes (or pulaskis) shall have 2-1/2 pound or larger heads and be not less than 28 inches in overall length.

1.7.4.1 For Diesel and Gasoline Operated Engines

For Project Activity Level A or higher, Constructor shall equip all diesel and/or gasoline-operated engines, both stationary and mobile, and all flues used in any contract and camp operations with spark arresters that meet Forest Service standards set forth in the National Wildfire Coordinating Group publication for Multi-position Small Engines, #430-1, or General Purpose and Locomotive, #430-2.

Spark arresters are not required on equipment powered by exhaust-driven turbo-charged engines or motor vehicles equipped with a maintained muffler as defined in California Public Resources Code (CPRC), Section 4442 and 4443.

1.7.4.2 For Vehicles and Construction Operating Equipment

For Project Activity Level A or higher, Constructor shall furnish and have available for emergency use on each vehicle used in conjunction with performance of the work (i.e., truck, pickup trucks, crew vehicle, tractor, grader and other construction equipment) hand tools and/or equipment as follows:

- One shovel,
- One axe (or pulaski), and
- A fully charged 2-A:10-B:C fire extinguisher, or larger.

1.7.4.3 For Machines with Hydraulic System

For Project Activity Level A or higher, Constructor shall equip each mechanized harvesting machine with hydraulic systems, powered by an internal combustion engine (e.g., chipper, feller/buncher, harvester, forwarder, stroke delimber, etc), except tractors and skidders, with at least two 4-A:80-B:C fire extinguishers, or equivalent. In addition, concentrations of wood dust and debris shall be removed from such equipment daily.

1.7.4.4 For Welders

For Project Activity Level A or higher, Constructor shall furnish one shovel and one backpack 5 gallon water-filled tank with pump with each welder.

1.7.4.5 For Non-Self-Propelling Gasoline or Diesel Powered Tools

For Project Activity Level A or higher, Constructor shall furnish one shovel and one pressurized chemical fire extinguisher for each gasoline-powered tool, including but not restricted to compressors, hydraulic accumulators, gardening tools (such as chain saws and weed trimmers), soil augers, rock drills, etc. Fire extinguishers shall be of the type and size necessary to provide assurance of controlling fire caused by use of portable power tools under various climatic and fuel conditions. Shovel must be kept within 100 feet from each chain saw when used off cleared landing areas.

1.7.4.6 Communication Capability

A. For Project Activity Level A or higher, Constructor shall furnish communication capability (e.g., a serviceable telephone, radio-telephone, or radio system) connecting each operation with the designated Forest Service Dispatch Center. A radio-equipped fire patrolperson vehicle will satisfy this requirement if in operation during the time required.

B. The communication system shall provide prompt and reliable communications between the Constructor's operations and the Forest Service Dispatch Center.

C. The communications system shall be operable during Constructor's operation in the fire precautionary period and at the time fire patrolperson service is required.

D. The communications system shall be capable of contacting the designated Forest Service Dispatch Center within five (5) minutes of discovery of a fire in the Constructor's operating area.

1.7.4.7 For Project Work Area

A. A project work area is an area where work is concentrated, including a zone extending 500 feet radially from the center of a work area.

B. For Project Activity Level B or higher, the following personnel and equipment shall be provided:

1.7.4.7.1 Fire Patrolperson

Constructor shall provide and stage the following personnel and equipment at each project work area:

A. One dedicated fire patrolperson who shall be responsible for patrol of the activities for prevention, detection, control, and extinguishing of fires;

B. One water filled five (5) gallons backpack pump dedicated to the fire patrolperson;

C. One water filled five (5) gallons backpack pump dedicated to the crew at the project work area; and

D. Proven working and reliable communication equipment, radio or cell phone, which guarantees communication path to 911 operator in case of emergency. This communication equipment can be vehicle equipment but must be portable if remote operation away from the vehicle is commenced.

1.7.4.7.2 Water Tank or Trailer

A. Constructor shall furnish a water tank truck or trailer. The truck may serve a dual purpose. The truck may be used to spray water on roads and work area to suppress dust as per SWPPP requirements. The main purpose shall be to assist in the fire prevention and fire fighting activities. The truck shall never have less than 300 gallons of water aboard, even when en-route to refill.

B. The water tank truck or trailer shall be located on or adjacent to the project work area and meet the following minimum specifications:

1. Contain at least 300 gallons of water;

2. A combination straight stream-fog nozzle with 300 feet of one-inch fire hose, with no segment longer than 50 feet;

3. Fire hose with nozzle closed shall be capable of withstanding 200 psi pump pressure without leaking, slipping of couplings, distortions, or other failures;

4. Nozzle discharge rating of six to 20 gallons per minute;

5. A pump capable of delivering 23 gallons per minute at 175 pounds psi at sea level;

6. Power unit for pump shall have fuel for at least two hours operation, with ample transport available for immediate and safe movement of tank over roads serving the contract area; and

7. Pump outlet shall be equipped with 1-1/2 inch National Standard Fire Hose thread.

1.7.4.7.3 Support Truck

Constructor shall provide one support truck for each heavy piece of equipment operating solo while mobile. The support truck shall follow the heavy equipment as it operates. As an example, as a grader grades a road, a support truck shall follow. This does not apply to a water truck.

1.7.4.8 For Heavy Construction Operating Equipment

For Project Activity Level C or higher, Constructor shall furnish and have available for emergency use on each heavy construction operating equipment used in conjunction with performance of the work additional fire fighting capabilities as follows:

A. An onboard self-extinguishing fire suppression system capable of extinguishing any equipment caused fire, or

B. A portable Class A fire suppression system capable of extinguishing a 20 foot by 20 foot wild land fire within 5 minutes of discovery. The Class A system shall meet the following specification:

- 100 feet of one inch hose,
- Minimum discharge distance of 50 feet,
- Minimum pressure of 100 psi at discharge orifice, and
- Sustainable for minimum of 5 minutes.

1.7.4.9 For Central Mobilization Area

For Project Activity Level C or higher, Constructor shall equip a centrally designated mobilization area, or at a concentrated long term project work area one sealed box of fire fighting tools. The box shall be sealed with a Forest Service seal to be broken for emergency use only. The box shall be unlocked during transmission line project construction activities. The box shall contain:

- Three (3) five gallons backpack pump-type fire extinguishers filled with water;
- Five (5) shovels;
- Five (5) axes;
- Five (5) McCleod fire tools;
- One (1) serviceable chain saw of 3-1/2 or more horsepower with a cutting bar 20 inches in length or longer.

1.7.4.10 For Tractor Dozer

For Project Activity Level C or higher, Constructor shall furnish two tractor headlights for each tractor dozer. Tractor headlights shall be attachable to each tractor and served by an adequate power source.

1.7.5 EMERGENCY MEASURES

A. The table set forth below establishes work restrictions and fire precautions that the Constructor must observe at each project activity level. The restrictions are cumulative at each level.

B. Constructor shall conform to the limitations or requirements of Project Activity Level (PAL) obtained from Forest Service before starting work each day. If practicable, Forest Service will determine the following day's activity level by 4:00 p.m. each afternoon. Activity level may be changed at any time if, in the judgment of the Forest Service, fire danger is higher or lower than predicted and such change is consistent with forest management objectives. The decision to change the activity level, and when, and how to take weather observations for that purpose, are within the discretion of Forest Service.

C. PAL applicable to this project shall be for Fuel Model G, National Fire Danger Rating System, and Remote Automated Weather Station (RAWS) or fire danger rating area stated in the legend of Project Area Map.

PROJECT ACTIVITY LEVELS

Level	Project Activity Requirements
A	1. As required by Sections 1.7.4.1 through 1.7.4.6 above
B	1. As required by Sections 1.7.4.1 through 1.7.4.7 above 2. Furnish fire patrolperson. A fire patrolperson is required for mechanical operations, including equipment with high speed rotary heads (i.e., > 1,100 RPM) from cessation of operations until 2 hours after operations cease or sunset, which ever occurs first.
C	1. As required by Sections 1.7.4.1 through 1.7.4.10 above 2. Fire patrolperson is required until sunset local time. 3. The following operations are prohibited from 1:00 PM until 8:00 PM local time: a) Blasting b) Dead tree felling (with high speed rotary head), limbing, or bucking except recently dead trees. c) Operating high speed rotary head equipment.
D	1. As required by Sections 1.7.4.1 through 1.7.4.10 above 2. The following operations are prohibited between hours of 10:00 AM and 8:00 PM local time: a) Blasting; b) Mechanized operations for felling (with high speed rotary head), bucking, and limbing; and c) Felling dead material.

D 3. The following activities may not operate between hours of 1:00 PM and 8:00 PM local time except by special permit:

a) Rubber tired skidding
b) Chipping on roads or landings
c) Cable yarding
d) Welding or cutting of metal
e) Road maintenance
f) Culvert installation
g) Dirt moving
h) Helicopter Yarding
i) Hand slash disposal
j) Chainsaw operations on landings and roadbeds

4. Other operations may continue after 1:00 PM local time, if they meet the following requirements:

A fire patrolperson is required to walk all areas treated that day once per hour, until sunset local time. This includes chainsaw felling, metal track skidding, machines with chainsaw cutting heads and mastication equipment.

Ev 1. As required by Sections 1.7.4.1 through 1.7.4.10 above

2. The following activities may operate:

a) Loading of trucks at landing and Hauling
b) Equipment at approved sites may be serviced
c) Roads: Dust abatement or rock aggregate installation (does not include pit development)

3. Other operations may continue until 1:00 PM local time when Constructor and Forest Service agree to variance.

E 1. As required by Sections 1.7.4.1 through 1.7.4.10 above

2. The following activities may operate:

a) Loading of trucks at landing and Hauling
b) Equipment at approved sites may be serviced
c) Roads: dust abatement or rock aggregate installation (does not include pit development)

1.7.6 REPORTING FIRES

Constructor shall report all fires to any of the following Forest Service facilities and/or personnel listed below, but not necessarily in the order shown:

	Name	Address and/or Telephone number
Dispatch Center		
Nearest FS Station		
Inspector		
COR		
District Ranger		
D.R. Designated Rep		

When reporting a fire, provide the following information:

- Your name
- Call back telephone number
- Project name
- Location
- Legal description (Township, Range, Section); and Descriptive location (Reference point).

Fire Information:

- Acres;
- Rate of spread; and
- Wind conditions

Constructor's Plan Regarding Personnel, Equipment and Organization

The Constructor shall, prior to commencing work, furnish the following information relating to key personnel, tools and equipment available for the purpose of fighting wild fires within and adjacent to the Contract Area:

KEY PERSONNEL: (In order of call preferences)

	Name	Address and/or Telephone Number
Fire Supervisor		
Fire Patrolperson		

PERSONNEL AND EQUIPMENT:

	Number	Classification, Type, Make & Model
Fire Fighters		
Fallers		
Power Saws		
Other Equipment		

Contractor's Signature

Date

Contractor's Officer's Signature

Date

Eldorado-Ivanpah Transmission Project

Water Use Maximum

Southern California Edison

Eldorado-Ivanpah Transmission Project

MM W-2 Water Use Maximum

The Water Use Maximum (MM W-2) of 32,000 to 40,000 gallons per day (gpd)[1] for the Eldorado-Ivanpah Transmission Project (EITP), which was stated in the Final EIR/EIS, has been revised to account for an increase in water usage for fugitive dust control and irrigation for the revegetation staging areas.[2]

The primary water usage for the EITP will be for fugitive dust control for the active and staging areas, where the quantity of water applied will be dependent on the ambient environmental conditions. It is estimated that approximately 82,000 to 90,000 gpd of water may be utilized for fugitive dust control, which is necessary to meet the conditions set forth in the EITP's Fugitive Dust Control Plans. This is equivalent 91.8 to 100.8 acre-feet per year (afy).

Water will also be required for the restoration of the cactus and yucca salvage and replanting, which includes fugitive dust control along the routes to the revegetation staging areas. The required water will not be needed on a daily basis and is dependent on ambient environmental conditions. It is estimated between 600,000 to 750,000 gallons of water on an annum basis will be needed for both irrigation and fugitive dust control for the revegetation staging areas. This is equivalent to 1.8 to 2.3 acre-feet per year.

The revised Waste Use Maximum for the EITP on an annum basis is 103.1 acre feet per year.[3] The source of water during the construction phase will be provided primarily by Molycorp Minerals's Shadow Valley Well Field, which is located 9 miles west of Mountain Pass, California. The four wells that makeup the Shadow Valley Well Field's can yield a flow rate of 49,800 gallons per hour without any additional increase of production to the well field. Due to the varying distance of transporting water related to the specified construction phase, additional sources may be utilized. These sources of water are from the Las Vegas Valley Water District (Jean, Nevada) and City of Henderson (Nevada), which can respectively supply the EITP approximately 15,000 gpd and 90,000 gpd of water from their facilities.

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[1] This translates to 35.8 to 44.8 acre-feet/year, not the 30.6 to 38.3 acre-feet per year shown in the Final EIR/EIS, which was in error due to a conversion miscalculation.

[2] There will also be water stored for emergency fire suppression, which is negligible.

[3] There is no planned water usage for the operational phase of the EITP.

Eldorado-Ivanpah Transmission Project

Dry Lake Restoration Plan

Dry Lake Restoration Plan

for the

Eldorado-Ivanpah Transmission Project

San Bernardino County, California

Prepared by:

Southern California Edison

1218 South 5th Avenue

Monrovia, CA 91610

September 2011

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Appendices

Appendix A. Excerpt from USACE Jurisdictional Delineation (GANDA 2010, Appendix C).

1.0 Introduction

Southern California Edison (SCE) intends to construct the Eldorado-Ivanpah Transmission Project (EITP or "project") to increase electric power transmission capacity to accommodate solar generation facilities anticipated to be developed in the Ivanpah Valley area near the California-Nevada border. The EITP will replace approximately 35 miles of existing single-circuit 115-kV subtransmission line with a double-circuit 220-kV transmission line that will follow the existing SCE right-of way (ROW) between the Ivanpah Dry Lake area and the existing Eldorado Substation. The project alignment crosses the north end of Ivanpah Dry Lake. The EITP is located in Clark County, Nevada and San Bernardino County, California near Primm, Nevada (Figure 1, Vicinity Map).

This Dry Lake Restoration Plan (DLRP) specifically describes the proposed methods to restore discrete areas in Ivanpah Dry Lake that would be disturbed by construction of the EITP. Areas temporarily disturbed by construction that will be restored include work areas for the construction of at least 10 new 220-kV towers, work areas needed to dismantle and remove 14 existing 115-kV towers, 115-kV spurs or temporary access roads, and pulling, splicing, and tensioning areas within the dry lake bed. This Plan also describes success criteria, monitoring and reporting requirements for the lake bed restoration areas.

This DLRP is provided as a supplement to the EITP's Reclamation, Restoration, and Revegetation Plan (RRRP), which is the comprehensive plan to reestablish native vegetation in areas disturbed during construction. Both the RRRP and this DLRP are required under specific mitigation measures set forth in the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) (i.e., Mitigation Measure (MM) BIO-2 and MM W-4, respectively) which guide habitat mitigation and monitoring activities for the entire project alignment. However, unlike the RRRP, the DLRP does not involve reestablishing any vegetation because the Ivanpah Dry Lake bed exhibits virtually no native vegetative cover.

2.0 Plan Purpose, Need and Objectives

The purpose of this Plan is to provide a guide for implementing and monitoring lake bed restoration activities for discrete areas within Ivanpah Dry Lake that will be temporarily disturbed by implementation of the EITP. EITP implementation in the Dry Lake will involve removal of 14 existing 115-kV towers and transmission line which will be replaced by construction of 10 new lattice steel towers (LSTs) and stringing the new 220-kV transmission line on the new LSTs in the Dry Lake Bed. The main objective of implementing this plan is to ensure that disturbed areas within the dry lake are restored to pre-project conditions upon completion of construction activities.

This plan fulfills MM W-4 of the project's FEIR/EIS, as presented below. MM W-4 requires development of a restoration plan to ensure that the dry lake bed is restored to preconstruction conditions. As noted in MM W-4, this plan is subject to review by the BLM. The measure also indicates that BLM will evaluate the results of restoration and determine whether the Ivanpah Lake surface has been restored to preconstruction conditions. This plan must also be submitted to the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Game (CDFG), the Lahontan Regional Water Quality Control Board (RWQCB), and a copy provided to the California Public Utilities Commission (CPUC).

3.0 Project Overview

3.1 Project Location

The area containing the EITP is located in the Mojave Desert in eastern San Bernardino County, California, and Clark County Nevada (See Figure 1, *Eldorado – Ivanpah Transmission Project Vicinity Map*). Ivanpah Dry Lake is located entirely within California on land managed by the Bureau of Land Management (BLM), and the segment of the project within the Dry Lake is found on U.S. Geological Survey (USGS) 7.5 min. Ivanpah Lake Quadrangle Map, and spans Township 17N, Ranges 14E and 15E, and Sections 24, 19, 18, and 17 (Figure 2, *Ivanpah Dry Lake Vicinity Map*).

The EITP transmission line crosses the northern end of the lake at a northwest to southeast angle and intercepts approximately 2.4 miles of the dry lake bed except where it also crosses Interstate 15 which is constructed on fill above the lake bed. The transmission line segment within Ivanpah Dry Lake on the west side of the Interstate is accessed via Yates Well Road and the segment on the east side of the Interstate lies just off East Primm Boulevard near Primm.

3.2 Project Description

The EITP project entails removing and replacing a 35-mile section of the existing Eldorado-Baker-Coolwater-Dunn Siding Mountain Pass 115-kV transmission line with the new Eldorado-Ivanpah 220-kV double-circuit transmission line. The project will also construct a new substation (Ivanpah Substation), install upgrades within the existing Eldorado Substation, and install a redundant telecommunications link between the Ivanpah and Eldorado substations. The new telecommunication linkage will be first strung along the existing 500-kV Eldorado-Lugo transmission line for approximately 25 miles between the Eldorado Substation and Nipton Road, then would be installed underground for approximately 5 miles along the northern edge of Nipton Road, thence connecting to a new microwave tower a short distance north of Nipton, California. The final element of the telecommunication linkage would involve microwave signals transmitted between the new tower near Nipton and another new tower constructed eight miles away at the Ivanpah Substation.

Site preparations and construction and demolition efforts would be accomplished using different types of equipment and vehicles to perform multiple project efforts such as road clearing and grading, dismantling and removal of existing facilities, moving equipment and material, and installing project components. Equipment to be used would include small vehicles, such as pick-up trucks, up to large semi-trucks for hauling equipment, material, and personnel, specialized trucks for specific work elements such as drill rigs, concrete mixers, pumping trucks, bucket trucks, as well as a boom crane, rough terrain crane, and truck cranes and other support trucks for moving and erecting the towers and substation equipment. Helicopters will be used in areas where access is limited or impractical for particular activities and for transmission line stringing operations. Tensioning, pulling, and splicing equipment will be used for wire stringing operations.

EITP impacts within Ivanpah Dry Lake will involve the construction of ten (10) 220-kV towers along the same alignment as the existing 115-kV line. However, recent construction plan refinements reduced the total number of transmission towers expected to be needed (May 2011) which also reduced the impact associated with construction. Permanent impacts associated with tower construction within the dry lake include pouring four concrete footings for each new tower. Temporary impacts are expected to involve limited disturbance in discrete construction areas surrounding each new 220-kV tower site and as well as minor disturbance within the discrete work areas and temporary laydown areas associated with each of the fourteen (14) 115-kV tower removal sites. Vehicle and equipment traffic across the dry lake bed will occur on the existing access road along the 115-kV line alignment.

In total, project construction was previously estimated to result in up to 13.45 acres of temporary impacts and not more than 0.014 acres of permanent impacts to the surface of Ivanpah Dry Lake (GANDA 2011). Since construction plan refinements have reduced the total number of new towers to be constructed on the lake bed, the impacts are expected to be substantially less than previously estimated.

3.3 Environmental Setting

In California, the EITP traverses Ivanpah Dry Lake and then proceeds to the future Ivanpah Substation site located southwest of the lakebed on the lower part of a broad bajada that extends over this part of the Ivanpah Valley. The hot, dry climate in the project area is typical of the Mojave Desert region. The area typically receives from three to eight inches of rain per year, which falls mostly during the winter months, though thunderstorms do occur during the summer. Flash floods are not uncommon and contributed to the extensive formation of alluvial fans throughout the region.

Windy conditions are very common throughout the region. Winds over 50 mph are not uncommon, sometimes associated with thunderstorms. Prevailing wind direction in the area is typically from the southwest.

Eldorado-Ivanpah Transmission Project

Figure 1
Project Vicinity

LEGEND

- Transmission Line Route
- 115 kVTransmission Line Route
- Telecommunication Line Route
- Microwave Signal
- Substations
- Microwave Tower
- Railroads
- Streets/Highways
- State Boundary
- Mojave National Preserve

0 2 4 Miles

0 2 4 Kilometers

1:180,000 1 inch = 15,000 feet

SCE Corp Environment, Health & Safety
Eldorado-Ivanpah Transmission Project
Projection: NAD 83 UTM Zone 11N
Date: 4/27/2011

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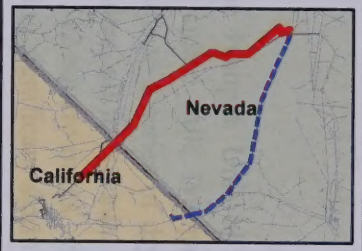
Eldorado-Ivanpah Transmission Project

Figure 2
Ivanpah Dry Lake Vicinity Map

Legend

- Existing 115kV Tower Locations
- Proposed 220kV Construction Area
- **Proposed Transmission Route**
- **Streets/Trails**
- **State Boundary**

1:24,000 1 inch = 2,000 feet



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Path: C:\Projects\2011 surveys\EITP\ArcGIS\Preliminary\borehole\Figure 2 Ivanpah Dry Lake Vicinity Map.mxd

The California portion of the project falls within the Ivanpah Unit of the South Lahontan Hydrologic region and is located within the 2,830 square mile Ivanpah-Pahrump Valleys, California, Nevada. The area containing the EITP drains to a series of dry lakes: Ivanpah Dry Lake, in California, and Roach, Jean, and Eldorado Lakes, all in Nevada. The watershed area that supplies Ivanpah Dry Lake covers approximately 512 square miles. Surface water is only present within the project area for brief periods following significant storm events (NRCS 2006 and 2007).

Ivanpah Lake is classified as a playa (NRCS 2006). Playas are composed of lacustrine deposits and are very poorly drained. Ponding is frequent, and slopes range from 0 to 1 percent. The typical playa soil profile is silty clay loam from 0 to 6 inches, and clay from 6 to 60 inches. Playa soils are included on the National Hydric Soils List (NRCS 2010). Surrounding the lake are alkaline soils supporting Desert Saltbush Scrub dominated by allscale and creosote bush (Holland 1986).

3.4 Regulatory Jurisdiction

Ivanpah Lake is the terminal water body for subwatersheds occurring in both California and Nevada. The playa surface at Ivanpah Lake is used for land sailing recreational activities, and under the interstate Commerce Clause (CFR§ 328.3(a)(3)) has been determined to be a water of the U.S. and subject to USACE jurisdiction (Approved Jurisdictional Determination, File No. SPK-2010-00576-SG, dated December 16, 2010). As a water of the U.S., any proposed dredge and fill activities within the lake are regulated by the USACE under Clean Water Act (CWA) §404. As a water of the U.S., dredge and fill activities within the lake are also regulated by the RWQCB under CWA §401. Ivanpah Dry Lake is also considered waters of the State of California, and thus is a jurisdictional water under the Porter-Cologne Water Quality Control Act (California Water Code §13000), also administered by the RWQCB.

Ivanpah Dry Lake is also subject to regulatory jurisdiction under California Fish and Game Code §1602, and activities which may impact the lake are regulated by the CDFG.

4.0 Restoration Plan

Mitigation Measure W-4 set forth in the project FEIR/EIS requires that the lakebed surface in Ivanpah Lake be restored to preconstruction conditions after the existing transmission towers and line have been replaced. Implementing restoration of the lake bed will involve several steps. First, the existing condition of the lake bed surface will be documented within each discrete area anticipated to be disturbed during the project activities (i.e., 115-kV tower removal, 220-kV tower construction, wire pulling, etc.). Second, during construction monitors will document the actual disturbance within these areas. Third, during or after construction, excavated soils will be replaced to the extent practical or removed for proper disposal and any disturbed areas will be

restored to pre-construction conditions by blending with native surface material and/or stabilizing loose surface materials.

The subsequent sections present guidelines and specifications for implementation and monitoring the lake bed restoration process.

4.1 Restoration Objective

The primary goal in implementing this plan is to restore those discrete areas within the lake bed disturbed by the EITP activities so that the post-project condition is comparable in character to the pre-project conditions of the discrete areas, as well as to the immediately surrounding area of undisturbed lake bed.

4.2 Documenting Pre-Construction Conditions

The pre-construction condition of the Ivanpah Dry Lake surface will be documented for each discrete area affected by project disturbance, such as construction of new towers and removal of old tower structures, along the EITP corridor. The pre-construction condition will be recorded most accurately by photographic documentation with notes to accompany photographs using the following guidelines.

1. Photographic documentation points (photo-points) will be mapped using a handheld GPS to record the coordinates of each photo-point location. The orientation (e.g. north, south, east, and west) of each photograph taken will also be recorded at each photo-point so that comparable views can be reproduced during subsequent post-construction surveys.
2. A minimum of one photo-point will be established at each tower removal location, each new tower location, each storage/stockpile area, and along all access routes. Linear impacts, (i.e. access routes) will be documented with a maximum spacing of photo points every 300 feet (unless line of sight is obstructed, requiring closer spacing of photo-points).
3. Notes will be taken for each discrete area that include relevant information as described above to accompany photographs and to provide brief descriptions of any unique or relevant characteristics associated with each discrete area such as existing depressions, surface traits, or evidence of existing soil disturbance, etc.

4.3 Lakebed Restoration

The following practices and actions will be implemented during and after construction activities to minimize disturbance and to restore the lake bed to pre-project conditions following completion of the project.

1. Throughout the duration of construction activities all relevant measures specified in the project approved Storm Water Pollution Prevention Plan (SWPPP) and any applicable best management practices (BMPs) outlined therein would be implemented as prescribed.

2. The top six inches of soil excavated from each new footing location will be stockpiled in loose uncompacted piles and kept separate from subsoil excavated from further below mean grade. Such salvaged surface materials will be used to cap all backfilled holes.

3. During excavation for the new tower footings, excavated subsoil materials (i.e., below a depth of six inches) will be temporarily side cast and then used for backfilling around the new footings, to the extent feasible.

   Backfill material will be placed in holes in lifts, with lifts compacted to approximately the same bulk density of the surrounding soil to avoid future settling. Any rock fragments encountered in the excavated material should be deposited deep within the backfilled holes (minimum depth of 60 inches) to avoid future migration of these rock fragments to the lake surface.

   Any excess excavated materials that may remain after backfilling will first be used to complete backfilling any holes left after the removal of the 115-kV tower footings to ensure that these areas will be restored to match surrounding grade.

4. The remaining excavated material will be evenly broadcast over the access road(s) and work area for each discrete tower location. The broadcast materials must be firmly tamped into place to minimize dust and potential erosion. The broadcast materials should be blended with existing surface material to match surrounding grades, and applied so as to not raise local surface elevations or create obstructions within any portion of the lake bed.

5. If stockpiled or side cast materials need to remain in place for greater than one month or for any period within the rainy season (November through March), standard or project-specific BMPs (e.g., pile perimeters secured with straw wattles and piles covered with plastic sheeting) shall be implemented in accordance with the relevant project SWPPP to avoid migration of sediment. Stockpiles that remain for periods longer than three months must be periodically monitored and covered as needed to prohibit weeds or weeded as needed.

6. To avoid excessive rutting in the surface of the lake bed, crews must avoid driving vehicles on the lake surface when surface conditions are moist. Any areas impacted by access roads and/or vehicle tracks shall be smoothed and blended with the existing grades. In areas where excessive soil compaction is likely, restoration actions described in the RRRP may be utilized to reduce compaction.

7. All construction materials, debris (concrete, gravel, rebar, etc.) and trash will be removed and legally disposed of off-site.

If photo-documentation or site surveys indicate reveal that certain discrete areas do not exhibit evidence that indicates the pre-existing conditions have been restored, as described below in Section 5.1 or for example, that the backfilled footing locations at the tower removal sites have settled excessively during the first rainy season(s), the discrete areas not meeting the success

criteria shall be re-contoured and re-evaluated, after the next successive rainy season as detailed in Section 5.2 below.

5.0 Post-Construction Monitoring & Reporting

Post-construction documentation, including photo-documentation, will be conducted to establish as-built conditions following construction and restoration activities. In addition, a qualified restoration ecologist will inspect all restored areas within the lakebed to document successful lakebed re-establishment.

Post-construction initial inspection surveys of disturbed areas within the dry lake bed will be conducted immediately after construction. Then, after lake bed restorative efforts are completed, periodic inspections will be performed for a period of two years commencing after the first rainy season (i.e., November through March) post-construction. If total rainfall during the preceding season is less than a typical season (e.g., total rainfall measures less than 3 inches within 5 to 10 miles of Ivanpah Dry Lake) then a subsequent inspection of restored areas will be required to be completed following a winter during which the area does receive a typical level of precipitation[1] (e.g., > 3").

5.1 Lake Bed Restoration Standards

The primary criteria for measuring success will be the reestablishment of pre-construction surface levels and contours along with any other representative surface characteristics and that disturbed areas exhibit stability relative to pre-construction conditions. Several observable features may be considered to represent fulfillment of these criteria, as follows:

- Disturbed soils and broadcast excavated materials appear to blend with the surrounding soils to match original grade of the lake bed surface. Differences of less than two inches as compared to original grade shall be considered negligible.
- If depressions or mounds develop that exceed two inches, or if vegetation becomes established in any depression, the vegetation should be removed, the depression filled and mounds leveled, and the soils compacted to a surface level with the surrounding ground.

[1]Precipitation levels in the project area can vary considerably from year to year. Therefore it is important to determine that discrete areas that have been disturbed and restored exhibit stable surface conditions after a normal rainy season. If particularly dry conditions prevail it is possible that the final survey may be postponed for several years until the area experiences a "normal" or average amount of precipitation. It is also possible that one or more summer monsoon events could provide sufficient rainfall to substitute for an entire rainy season precipitation, at the discretion of the restoration ecologist.

- The restored lake bed surface exhibits a smooth, flat appearance devoid of any substantial ruts, depressions, mounds (e.g., > 3") or large rocks.
- The restored areas exhibit stability (i.e., no noticeable change in surface conditions such as level, contour, pre-existing characteristics) through at least one typical rainfall cycle equivalent to an average natural hydrologic cycle (e.g., precipitation events within a 12-month period totaling at least 3"or more).
- Restored areas contain no loose material (as compared with pre-construction conditions).
- Restored areas contain no piles or humps and no depressions or holes (as compared with pre-construction conditions).

5.2 Documenting and Reporting Post-Construction Conditions

Following construction and restoration activities each discrete restored area will be surveyed to document site conditions as follows:

1. Photographs will be taken at each mapped pre-construction photo-point at the same orientation as those taken during the pre-construction survey to allow comparison.
2. The restoration ecologist will document existing site conditions observed throughout the restoration areas across the lake bed for comparison with notes made during the pre-construction survey.
3. The restoration ecologist will identify any discrete restoration areas that do not meet the lake bed restoration standards and recommend appropriate actions to correct discrepancies.
4. A report documenting the results of the initial survey will be provided to the BLM.

A supplemental survey will be performed in late March or April at least 12 months after initial restoration efforts are completed in the lake bed to determine whether restored areas exhibit surface stability following the winter rainy season as follows:

1. The restoration areas will be inspected again following the next rainy season or set of cumulative rainfall events during a 12 month period when at least 3" of precipitation occurs in the region, or as is considered "typical" or "average" for the area. This subsequent survey will follow the same methodology and reporting requirements described above.
2. Any areas identified as not meeting the lake bed restoration standards will be documented and restored, as noted above. These areas will be resurveyed following the next rainy season which receives typical precipitation levels for the area.
3. A final survey report will be prepared and submitted to the BLM when all restoration areas within the lake bed are determined to have met the standards outlined in Section 5.1 above,

and have demonstrated stability through at least one rainy season which receives typical precipitation levels for the area.

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Appendix A

Excerpt from USACE Jurisdictional Delineation (GANDA 2011, Appendix C)
Maps 1-3 of transmission line through Ivanpah Lake

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 1 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

GANDA

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 2 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

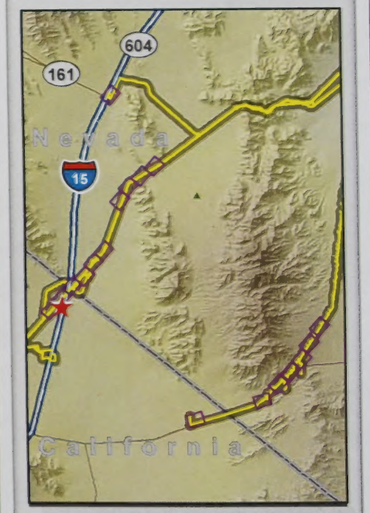
Pole
Transmission line
Telecom
Access road
220 kV tower
115 kV tower
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary



Project Location

GANDA

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 3 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

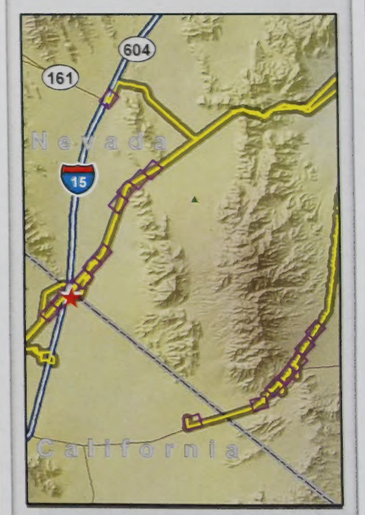
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

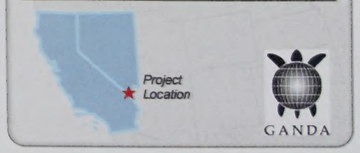
Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary





Eldorado-Ivanpah Transmission Project

Drainage Crossing Design Plan

Eldorado-Ivanpah Transmission Project

Drainage Crossing Design Plan

DRAFT

Drainage Crossing Design (MM BIO-6)

Eldorado-Ivanpah Transmission Project

San Bernardino County, California

Prepared for:

Southern California Edison

1218 South 5th Avenue

Monrovia, CA 91610

Source: Caltrans Storm Water Quality Handbooks, 2003
Construction Site Best Management Practices Manual
Temporary Stream Crossing NS-4

October 2011

DRAFT

Drainage Crossing Design (MM BIO-6)

Eldorado-Ivanpah Transmission Project

San Bernardino County, California

Prepared for

Southern California Edison

Monrovia, CA 91016

EDISON

Lead:

Contributors:

Prepared:

December 2011

Natural Wet Crossing

Definition and Purpose

A natural wet crossing is a non-structural method of crossing an ephemeral waterway that reduces the grade of the stream's banks to create an established roadway which allows vehicles to cross the waterway during construction and for on-going maintenance. The natural wet crossing reduces off-road vehicle traffic and minimizes erosion and downstream sedimentation caused by the vehicle traffic.

Appropriate Applications

Natural wet crossings are installed at sites:

- Where appropriate permits have been secured (1602 Agreements, 404 Permits, and 401 Certification).
- Where construction equipment or vehicles need to frequently cross ephemeral waterways.
- Where inspection and maintenance equipment or vehicles will need on-going, periodic access.
- When alternate access routes are unavailable or impose significant constraints.
- When structural crossing solutions are impractical or unwarranted due to:
    - Small channel width
    - Shallow channel banks
    - Infrequent flows

Limitations

- Will usually disturb the waterway during initial grading and periodic (semi-annual) maintenance grading.
- May require Regional Water Quality Control Board (RWQCB) 401 Certification, U.S. Army Corps of Engineers (USACE) 404 Nationwide permit, and California Department of Fish and Game (CDFG) 1602 Streambed Alteration Agreement. If numerical-based water quality standards are mentioned in any of these and other related permits, testing and sampling may be required.
- May be impassible /unusable during, and immediately following periods when streams are flowing.
- May require significant restorative efforts if impacted by large magnitude storm event.

Standards and Specifications

General Considerations

Location of the natural wet crossing shall address:

- Type and frequency of construction equipment requiring access.
- Site selection where erosion potential is low.
- Site selection where side slopes are the least steep relative to the surrounding terrain, as practicable.

- Areas where the side slopes from road runoff will not spill into the side slopes of the crossing.
- Depth and stability of streambed substrate.

Construction Considerations:

- Stabilize construction roadways, adjacent work area and stream bottom against erosion.
- Construct during dry periods to minimize stream disturbance and reduce costs.
- Construct at or near the natural elevation of the stream bed to prevent potential flooding upstream of the crossing.
- Install temporary sediment control BMPs in accordance with sediment control BMPs presented in the project approved Storm Water Pollution Prevention Plan to minimize erosion of embankment into flow lines.
- Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a water body where riparian vegetation, or aquatic organisms may be destroyed, except as authorized, and as necessary to complete the work.
- Natural wet crossings shall be constructed to minimize scour.
- The exterior of vehicles and equipment that will encroach on the water body within the project shall be maintained free of grease, oil, fuel, and residues.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Precautions shall be taken to avoid damage to vegetation by people or equipment.
- Drip pans shall be placed under all vehicles when the vehicle or equipment is planned to be idle for more than one hour.

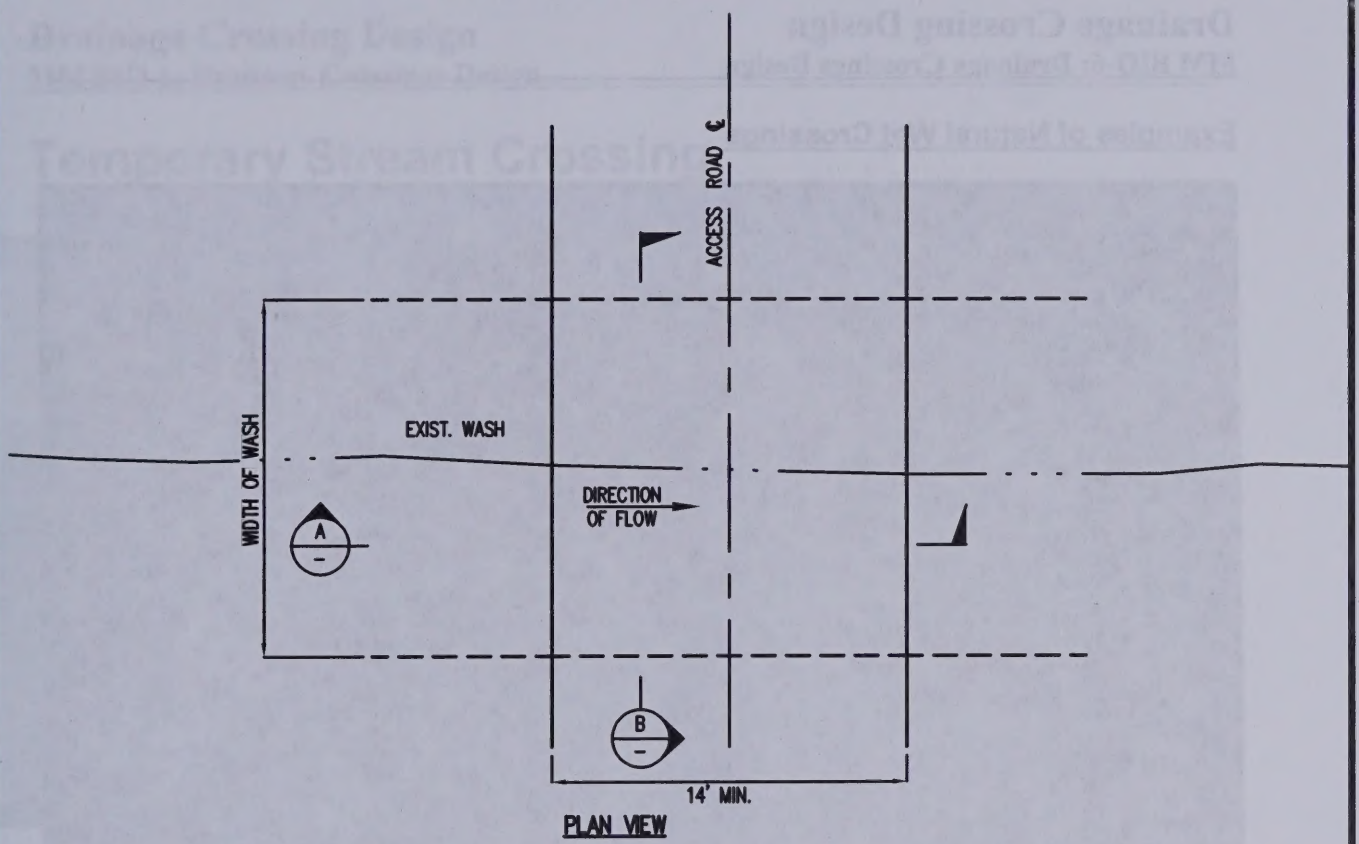
Specific Considerations:

- If large equipment such as cranes, and/or a large volume of construction traffic is anticipated (e.g., the natural wet crossing is located on main access road into the project site), a temporary crossing (i.e., ford) may be appropriate to install, during construction activities, to provide additional erosion protection and stabilization within the stream channel.

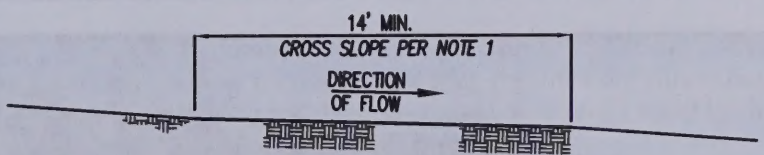
Maintenance and Inspection

Maintenance provisions shall include:

- Inspection shall, at a minimum, occur monthly and after each significant rainfall, and include:
    - Checking for erosion, channel/bank incisment or undercutting, and channel scour.
    - Checking for excessive sediment or debris deposition and other crossing obstructions.



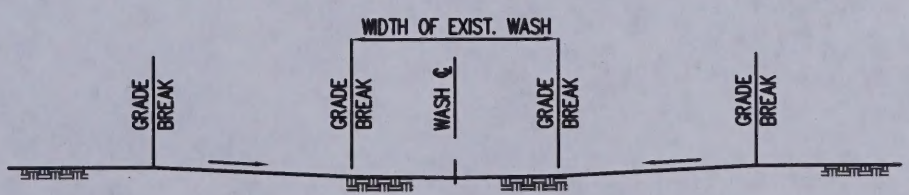
PLAN VIEW



NOTE:

1. CROSS SLOPE TO MATCH SLOPE OF EXISTING WASH.

SECTION A



SECTION B

No.	Revisions	Made	P.E.

Location: ELDORADO–IVANPAH TRANSMISSION PROJECT

NATURAL WET CROSSING

SOUTHERN CALIFORNIA EDISON® An EDISON INTERNATIONAL® Company

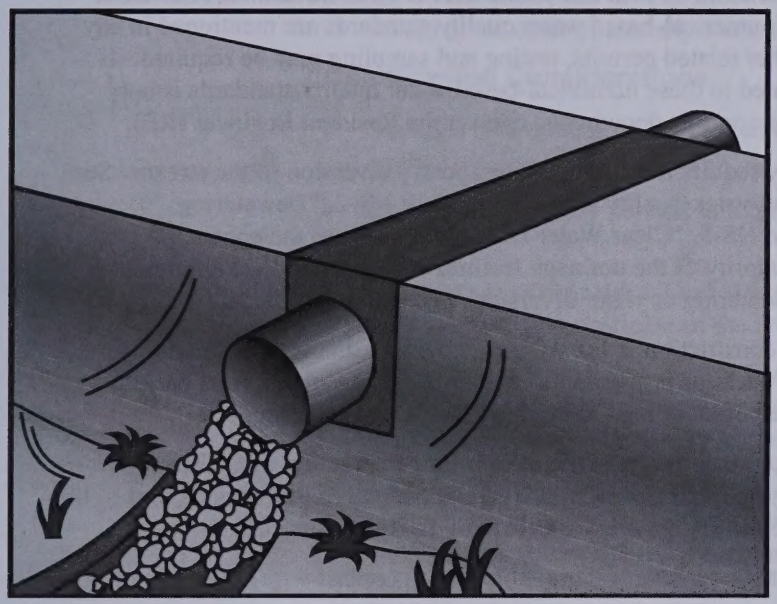
PRDT0001.DWG

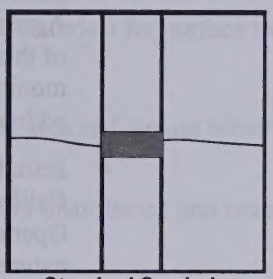
Drainage Crossing Design

MM BIO-6: Drainage Crossings Design

Examples of Natural Wet Crossings

Temporary Stream Crossing





Standard Symbol

BMP Objectives

- ● Soil Stabilization
- ○ Sediment Control
- ○ Tracking Control
- ○ Wind Erosion Control
- ● Non-Storm Water Management
- ○ Materials and Waste Management

Definition and Purpose

A temporary stream crossing is a structure placed across a waterway that allows vehicles to cross the waterway during construction, minimizing, reducing, or managing erosion and downstream sedimentation caused by the vehicles.

Appropriate Applications

Temporary stream crossings are installed at sites:

- Where appropriate permits have been secured (1602 Agreements, 404 Permits, and 401 Certification).
- Where a natural wet crossing is insufficient to prevent or reduce the risk of erosion and downstream sedimentation.
- Where construction equipment or vehicles need to frequently cross a waterway.
- When alternate access routes impose significant constraints.
- When crossing perennial streams or waterways causes significant erosion.
- Where construction activities will not last longer than one year.

Drainage Crossing Design

MM BIO-6: Drainage Crossings Design

Limitations

- Will usually disturb the waterway during installation and removal.
- May require RWQCB 401 Certification, USACE 404 Nationwide permit, and California Department of Fish and Game CDFG 1602 Streambed Alteration Agreement. If numerical-based water quality standards are mentioned in any of these and other related permits, testing and sampling may be required. If monitoring related to these numerical-based water quality standards is not addressed in the contract documents, contact the Resident Engineer (RE).
- Installation may require dewatering or temporary diversion of the stream. See California Stormwater Quality Association BMP NS-2, "Dewatering Operations" and NS-5, "Clear Water Diversion." Due to the ephemeral nature of the majority of the drainage features within the project alignment the need for dewatering or water diversions is not anticipated.
- May become a constriction in the waterway, which can obstruct flood flow and cause flow backups or washouts. If improperly designed, flow backups can increase the pollutant load through washouts and scouring.
- Use of natural or other gravel in the stream for construction of Cellular Confinement System (CCS) (refer to figure at the end of the section) ford crossing will be contingent upon approval by fisheries agencies.
- Ford crossings may degrade water quality due to contact with vehicles and equipment.
- CCS should not be used in excessively high or fast flows.
- Upon completion of construction activities, CCS blocks must be removed from stream.

Standards and Specifications

General Considerations

- Location of the temporary stream crossing shall address:
- Site selection where erosion potential is low.
- Areas where the side slopes from road runoff will not spill into the side slopes of the crossing.

The following types of temporary stream crossings shall be considered:

- Culverts - Used on perennial and intermittent streams.
- Fords - Appropriate during the dry season in arid areas. Used on dry washes and ephemeral streams, and low flow perennial streams. CCS, a type of ford crossing is also appropriate for use in streams.

Design and installation requires knowledge of stream flows and soil strength. Designs shall be prepared under direction of, and approved by, a registered civil and/or structural engineer. Both hydraulic and construction loading requirements shall be considered with the following:

- Comply with the requirements for culvert crossings, as contained in Specification E-2008-21 Construction of Transmission Line Access Roads and Tower Site Preparation, December 5, 2008, particularly if the temporary stream crossing will remain through the rainy season.

- Provide stability in the crossing and adjacent areas to withstand the design flow. The design flow and safety factor shall be selected based on careful evaluation of the risks due to over topping, flow backups, or washout.
- Avoid oil or other potentially hazardous waste materials for surface treatment.

Construction Considerations:

- Stabilize construction roadways, adjacent work area and stream bottom against erosion.
- Construct during dry periods to minimize stream disturbance and reduce costs.
- Construct at or near the natural elevation of the stream bed to prevent potential flooding upstream of the crossing.
- Install temporary sediment control BMPs in accordance with sediment control BMPs presented in the project approved Storm Water Pollution Prevention Plan to minimize erosion of embankment into flow lines.
- Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a water body where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as authorized by the RE, as necessary to complete the work.
- Temporary water body crossings and encroachments shall be constructed to minimize scour. Cobbles used for temporary water body crossings or encroachments shall be clean, rounded river cobble.
- The exterior of vehicles and equipment that will encroach on the water body within the project shall be maintained free of grease, oil, fuel, and residues.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Precautions shall be taken to avoid damage to vegetation by people or equipment. Disturbed vegetation shall be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble shall be removed upon completion of project activities.
- Any temporary artificial obstruction placed within flowing water shall only be built from material, such as clean gravel, that will cause little or no siltation.
- Drip pans shall be placed under all vehicles when the vehicle or equipment is planned to be idle for more than one hour.
- Conceptual temporary stream crossings are shown in figures at the end of this section.
- Prior to the installation of each temporary crossing, a qualified restoration ecologist shall document the site conditions of each crossing location.

- Following the removal of each temporary crossing, desert wash restoration and revegetation efforts shall be conducted in accordance with the Mitigation Monitoring Plan for Affected Jurisdictional Areas and the Reclamation, Restoration, and Revegetation Plan prepared for the project.

Specific Considerations:

- Culverts are relatively easy to construct and able to support heavy equipment loads.
- Fords are the least expensive of the crossings, with maximum load limits.
- Temporary fords are not appropriate if construction will continue through the rainy season, if thunderstorms are likely, or if the stream is perennial.
- CCS crossing structures consist of clean, washed gravel and cellular confinement system blocks. CCS are appropriate for streams that would benefit from an influx of gravel; for example, salmonid streams, streams or rivers below reservoirs, and urban, channelized streams. Many urban stream systems are gravel-deprived due to human influences, such as dams, gravel mines, and concrete channels.
- CCS allow designers to use either angular or naturally-occurring, rounded gravel, because the cells provide the necessary structure and stability. In fact, natural gravel is optimal for this technique, because of the habitat improvement it will provide after removal of the CCS.
- A gravel depth of 152 to 305 mm (6 to 12 inches) for a CCS structure is sufficient to support most construction equipment.
- An advantage of a CCS crossing structure is that relatively little rock or gravel is needed, because the CCS provides the stability.

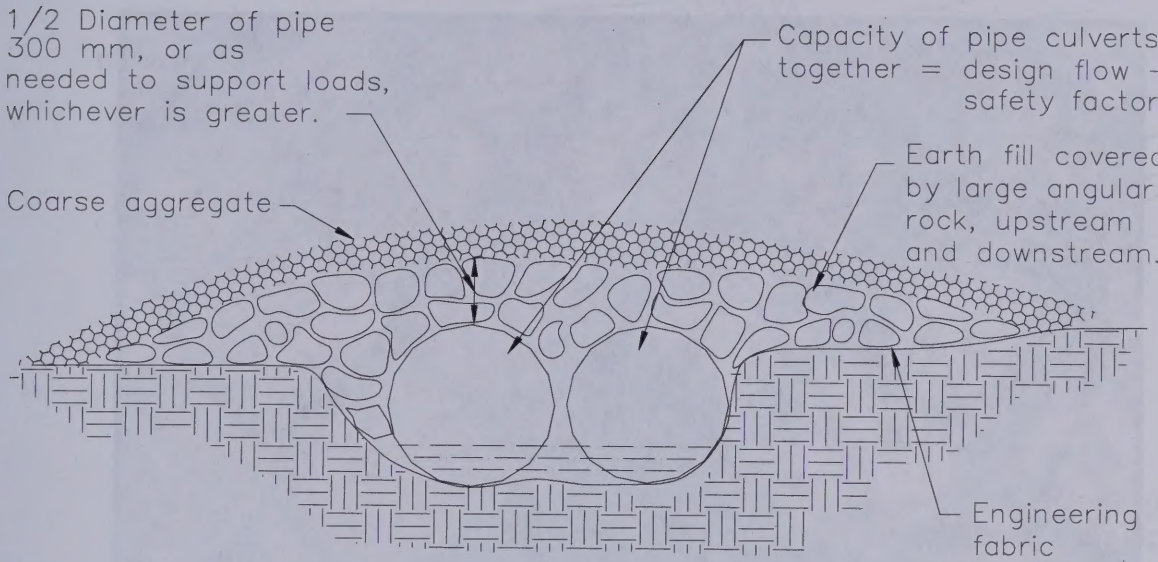
Maintenance and Inspection

Maintenance provisions shall include:

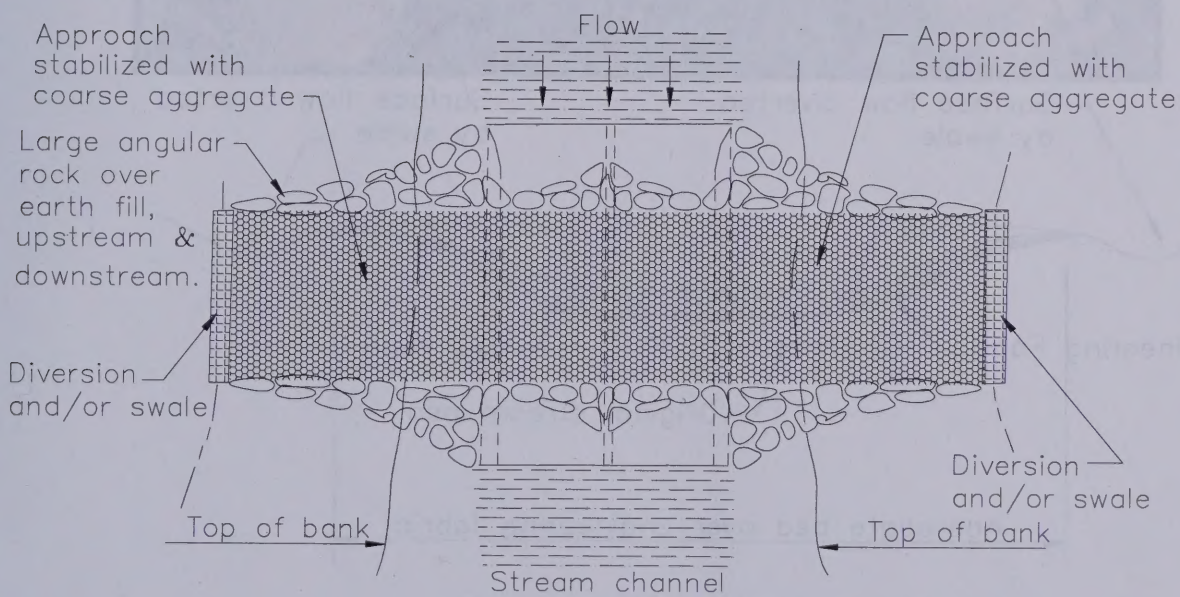
- Periodic removal of debris behind fords, in culverts, and under bridges.
- Replacement of lost protective aggregate from inlets and outlets of culverts.
- Removal of temporary crossing promptly when it is no longer needed.
- Inspection shall, at a minimum, occur weekly and after each significant rainfall, and include:
    - Checking for blockage in the channel, debris buildup in culverts or behind fords, and under bridges.
    - Checking for erosion of abutments, channel scour, riprap displacement, or piping in the soil.
    - Checking for structural weakening of the temporary crossing, such as cracks, and undermining of foundations and abutments.

Drainage Crossing Design

MM BIO-6: Drainage Crossings Design


1/2 Diameter of pipe 300 mm, or as needed to support loads, whichever is greater.
Capacity of pipe culverts together = design flow + safety factor
Earth fill covered by large angular rock, upstream and downstream.
Coarse aggregate
Engineering fabric

ELEVATION



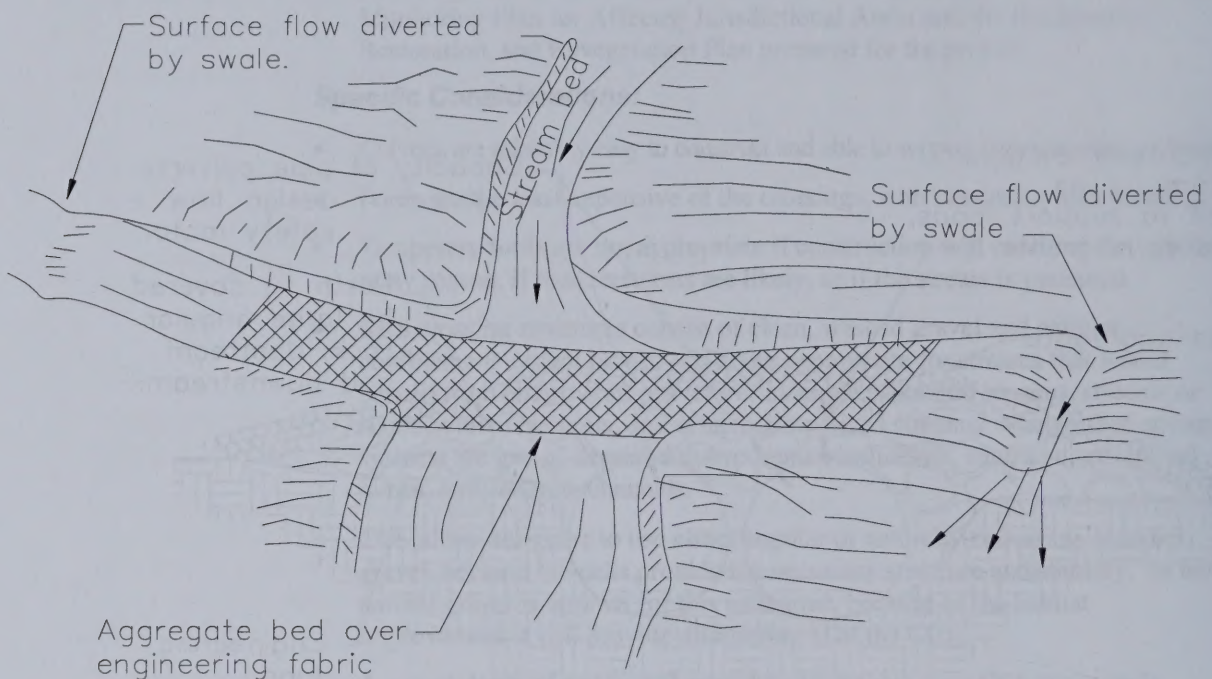
PLAN VIEW

TYPICAL CULVERT CROSSING

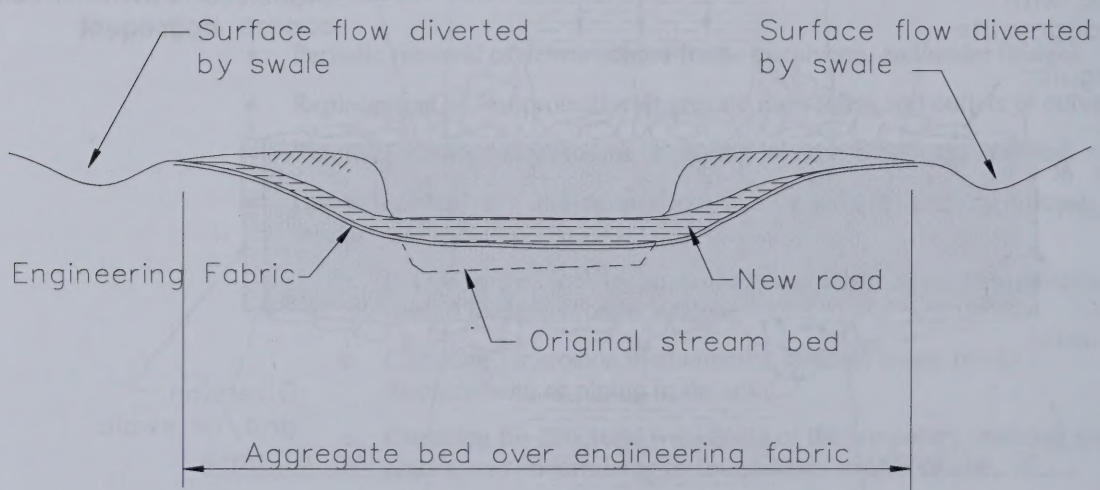
NOT TO SCALE

Drainage Crossing Design

MM BIO-6: Drainage Crossings Design



Aggregate approch
1:5 (V:H) Maximum slope on road



TYPICAL FORD CROSSING
NOT TO SCALE

CELLULAR CONFINEMENT SYSTEM

Eldorado-Ivanpah Transmission Project

California Manual on Uniform Traffic Control Devices for Streets and Highways

California Manual on Uniform Traffic Control Devices

for Streets and Highways

(FHWA's MUTCD 2003 Edition, as amended for use in California)

PART 6
Temporary Traffic Control

STATE OF CALIFORNIA
BUSINESS, TRANSPORTATION AND HOUSING AGENCY
DEPARTMENT OF TRANSPORTATION

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PART 6. TEMPORARY TRAFFIC CONTROL

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CHAPTER 6A. GENERAL

Section 6A.01 General

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

When the normal function of the roadway is suspended, TTC planning provides for continuity of the movement of motor vehicle, bicycle, and pedestrian traffic (including accessible passage); transit operations; and access (and accessibility) to property and utilities.

The primary function of TTC is to provide for the reasonably safe and efficient movement of road users through or around TTC zones while reasonably protecting workers, responders to traffic incidents, and equipment.

Of equal importance to the public traveling through the TTC zone is the safety of workers performing the many varied tasks within the work space. TTC zones present constantly changing conditions that are unexpected by the road user. This creates an even higher degree of vulnerability for the workers and incident management responders on or near the roadway (see Section 6D.03). At the same time, the TTC zone provides for the efficient completion of whatever activity interrupted the normal use of the roadway.

Consideration for road user safety, worker and responder safety, and the efficiency of road user flow is an integral element of every TTC zone, from planning through completion. A concurrent objective of the TTC is the efficient construction and maintenance of the highway and the efficient resolution of traffic incidents.

No one set of TTC devices can satisfy all conditions for a given project or incident. At the same time, defining details that would be adequate to cover all applications is not practical. Instead, Part 6 displays typical applications that depict common applications of TTC devices. The TTC selected for each situation depends on type of highway, road user conditions, duration of operation, physical constraints, and the nearness of the work space or incident management activity to road users.

Improved road user performance might be realized through a well-prepared public relations effort that covers the nature of the work, the time and duration of its execution, the anticipated effects upon road users, and possible alternate routes and modes of travel. Such programs have been found to result in a significant reduction in the number of road users traveling through the TTC zone, which reduces the possible number of conflicts.

Standard:

TTC plans and devices shall be the responsibility of the authority of a public body or official having jurisdiction for guiding road users. There shall be adequate statutory authority for the implementation and enforcement of needed road user regulations, parking controls, speed zoning, and the management of traffic incidents. Such statutes shall provide sufficient flexibility in the application of TTC to meet the needs of changing conditions in the TTC zone.

Support:

Temporary facilities, including reasonably safe pedestrian routes around work sites, are also covered by the accessibility requirements of the Americans with Disabilities Act of 1990 (ADA) (Public Law 101-336, 104 Stat. 327, July 26, 1990. 42 USC 12101-12213 (as amended)).

Guidance:

The TTC plan should start in the planning phase and continue through the design, construction, and restoration phases. The TTC plans and devices should follow the principles set forth in Part 6. The management of traffic incidents should follow the principles set forth in Chapter 6I.

Option:

TTC plans may deviate from the typical applications described in Chapter 6H to allow for conditions and requirements of a particular site or jurisdiction.

Support:

The criteria of Part 6 apply to both rural and urban areas. A rural highway is normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians. An urban street is typically characterized by relatively low speeds, wide ranges of road user volumes, narrower roadway lanes, frequent intersections and driveways, significant pedestrian activity, and more businesses and houses.

Per the provisions of the Construction Safety Orders in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 4, Article 11, Sections 1598 and 1599), this Part of the California MUTCD is incorporated by reference as part of those regulations.

It is the responsibility of the Contractor or Organization performing work on, or adjacent to, a highway to install and maintain such devices which are necessary to provide passage for the traveling public (including pedestrians and bicyclists) through the work, as well as for the safeguard of workers.

Standard:

Before work begins, traffic control plans, when developed for handling traffic through a construction or maintenance project, shall be approved by the Engineer of the public agency or authority having jurisdiction over the highway.

Support:

The following references from the California Vehicle Code relate to TTC:

- Section 112 – Amber.
- Section 165 – Authorized Emergency Vehicle.
- Section 291 – Department of Transportation.
- Section 385 – Local Authorities.
- Section 21351.3 – Use of Metric System Designations.
- Section 21363 – Detour Signs.
- Section 21367 – Traffic Control: Highway Construction.
- Section 21466.5 – Light Impairing Driver's Vision.
- Section 22362 – Speed Limit Where Persons at Work.

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CHAPTER 6B. FUNDAMENTAL PRINCIPLES

Section 6B.01 Fundamental Principles of Temporary Traffic Control

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

Construction, maintenance, utility, and incident zones can all benefit from TTC to compensate for the unexpected or unusual situations faced by road users. When planning for TTC in these zones, it can be assumed that it is appropriate for road users to exercise caution. Even though road users are assumed to be using caution, special care is still needed in applying TTC techniques.

Special plans preparation and coordination with transit, other highway agencies, law enforcement and other emergency units, utilities, schools, and railroad companies might be needed to reduce unexpected and unusual road user operation situations.

During TTC activities, commercial vehicles might need to follow a different route from passenger vehicles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous materials might need to follow a different route from other vehicles. The Hazardous Materials and National Network signs are included in Sections 2B.52 and 2B.53, respectively.

Experience has shown that following the fundamental principles of Part 6 will assist road users and help protect workers in the vicinity of TTC zones.

Guidance:

Road user and worker safety and accessibility in TTC zones should be an integral and high-priority element of every project from planning through design and construction. Similarly, maintenance and utility work should be planned and conducted with the safety and accessibility of all motorists, bicyclists, pedestrians (including those with disabilities), and workers being considered at all times. If the TTC zone includes a highway-rail grade crossing, early coordination with the railroad company should take place.

Support:

Formulating specific plans for TTC at traffic incidents is difficult because of the variety of situations that can arise.

Guidance:

General plans or guidelines should be developed to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment, with the following factors being considered:

A. The basic safety principles governing the design of permanent roadways and roadsides should also govern the design of TTC zones. The goal should be to route road users through such zones using roadway geometrics, roadside features, and TTC devices as nearly as possible comparable to those for normal highway situations.

B. A TTC plan, in detail appropriate to the complexity of the work project or incident, should be prepared and understood by all responsible parties before the site is occupied. Any changes in the TTC plan ~~should~~ **shall** be approved by ~~an official knowledgeable (for example, trained and/or certified) in proper TTC practices~~ the Engineer of the public agency or authority having jurisdiction over the highway.

Road user movement should be inhibited as little as practical, based on the following considerations:

A. TTC at work and incident sites should be designed on the assumption that drivers will only reduce their speeds if they clearly perceive a need to do so (see Section 6C.01).

B. Frequent and abrupt changes in geometrics such as lane narrowing, dropped lanes, or main roadway transitions that require rapid maneuvers, should be avoided.

C. Provisions should be made for the reasonably safe operation of work, particularly on high-speed, high volume roadways.

D. Road users should be encouraged to use alternative routes that do not include TTC zones.
E. Bicyclists and pedestrians, including those with disabilities, should be provided with access and reasonably safe passage through the TTC zone.
F. Roadway occupancy should be scheduled during off-peak hours and, if necessary, night work should be considered.
G. Early coordination with officials having jurisdiction over the affected cross streets and providing emergency services should occur before roadway or ramp closings.

Motorists, bicyclists, and pedestrians should be guided in a clear and positive manner while approaching and traversing TTC zones and incident sites. The following principles should be applied:

A. Adequate warning, delineation, and channelization should be provided to assist in guiding road users in advance of and through the TTC zone or incident site by using proper pavement marking, signing, or other devices that are effective under varying conditions. Providing information that is in usable formats by pedestrians with visual disabilities should also be considered.
B. TTC devices inconsistent with intended travel paths through TTC zones should be removed or covered. However, in intermediate-term stationary, short-term, and mobile operations, where visible permanent devices are inconsistent with intended travel paths, devices that highlight or emphasize the appropriate path should be used. Providing traffic control devices that are accessible to and usable by pedestrians with disabilities should be considered.
C. Flagging procedures, when used, should provide positive guidance to road users traversing the TTC zone.

To provide acceptable levels of operations, routine day and night inspections of TTC elements should be performed as follows:

A. Individuals who are knowledgeable (for example, trained and/or certified) in the principles of proper TTC should be assigned responsibility for safety in TTC zones. The most important duty of these individuals should be to check that all TTC devices of the project are reasonably consistent with the TTC plan and are effective in providing reasonably safe conditions for motorists, bicyclists, pedestrians, and workers.
B. As the work progresses, temporary traffic controls and/or working conditions should be modified in order to provide reasonably safe and efficient road user movement and to provide worker safety. The individual responsible for TTC should have the authority to halt work until applicable or remedial safety measures are taken.
C. TTC zones should be carefully monitored under varying conditions of road user volumes, light, and weather to check that applicable TTC devices are effective, clearly visible, clean, and in compliance with the TTC plan.
D. When warranted, an engineering study should be made (in cooperation with law enforcement officials) of reported crashes occurring within the TTC zone. Crash records in TTC zones should be monitored to identify the need for changes in the TTC zone.

Attention should be given to the maintenance of roadside safety during the life of the TTC zone by applying the following principles:

A. To accommodate run-off-the-road incidents, disabled vehicles, or emergency situations, unencumbered roadside recovery areas or clear zones should be provided where practical.
B. Channelization of road users should be accomplished by the use of pavement markings, signing, and crashworthy, detectable channelizing devices.
C. Work equipment, workers' private vehicles, materials, and debris should be stored in such a manner to reduce the probability of being impacted by run-off-the-road vehicles.

Each person whose actions affect TTC zone safety, from the upper-level management through the field workers, should receive training appropriate to the job decisions each individual is required to make. Only those individuals who are trained in proper TTC practices and have a basic understanding of the principles (established by applicable standards and guidelines, including those of this Manual) should supervise the selection, placement, and maintenance of TTC devices used for TTC zones and for incident management.

Good public relations should be maintained by applying the following principles:

A. The needs of all road users should be assessed such that appropriate advance notice is given and clearly defined alternative paths are provided.

B. The cooperation of the various news media should be sought in publicizing the existence of and reasons for TTC zones because news releases can assist in keeping the road users well informed.

C. The needs of abutting property owners, residents, and businesses should be assessed and appropriate accommodations made.

D. The needs of emergency service providers (law enforcement, fire, and medical) should be assessed and appropriate coordination and accommodations made.

E. The needs of railroads and transit should be assessed and appropriate coordination and accommodations made.

F. The needs of operators of commercial vehicles such as buses and large trucks should be assessed and appropriate accommodations made.

Standard:

Before any new detour or temporary route is opened to traffic, all necessary signs shall be in place.

All TTC devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, TTC devices that are no longer appropriate shall be removed or covered.

Support:

Refer to Department of Transportation's Highway Design Manual Section 110.7 for Traffic Control Plans. See Section 1A.11 for information regarding this publication.

Standard:

On State highways, covers for TTC signs shall be of sufficient size and density to completely block out the message so that it is not visible either during the day or at night. Covers shall be fastened securely to prevent movement caused by wind action. Refer to Department of Transportation's Standard Specifications Section 12-3.06. See Section 1A.11 for information regarding this publication.

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CHAPTER 6C. TEMPORARY TRAFFIC CONTROL ELEMENTS

Section 6C.01 Temporary Traffic Control Plans

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

A TTC plan describes TTC measures to be used for facilitating road users through a work zone or an incident area. TTC plans play a vital role in providing continuity of reasonably safe and efficient road user flow when a work zone, incident, or other event temporarily disrupts normal road user flow. Important auxiliary provisions that cannot conveniently be specified on project plans can easily be incorporated into Special Provisions within the TTC plan.

TTC plans range in scope from being very detailed to simply referencing typical drawings contained in this Manual, standard approved highway agency drawings and manuals, or specific drawings contained in the contract documents. The degree of detail in the TTC plan depends entirely on the nature and complexity of the situation.

Guidance:

TTC plans should be prepared by persons knowledgeable (for example, trained and/or certified) about the fundamental principles of TTC and work activities to be performed. The design, selection and placement of TTC devices for a TTC plan should be based on engineering judgment.

Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.

Traffic control planning should be completed for all highway construction, utility work, maintenance operations, and incident management including minor maintenance and utility projects prior to occupying the TTC zone. Planning for all road users should be included in the process.

Provisions for effective continuity of accessible circulation paths for pedestrians should be incorporated into the TTC process. Where existing pedestrian routes are blocked or detoured, information should be provided about alternative routes that are usable by pedestrians with disabilities, particularly those who have visual disabilities. Access to temporary bus stops, reasonably safe travel across intersections with accessible pedestrian signals (see Section 4E.06), and other routing issues should be considered where temporary pedestrian routes are channelized. Barriers and channelizing devices that are detectable by people with visual disabilities should be provided.

Option:

Provisions may be incorporated into the project bid documents that enable contractors to develop an alternate TTC plan.

Modifications of TTC plans may be necessary because of changed conditions or a determination of better methods of safely and efficiently handling road users.

Guidance:

This alternate or modified plan should have the approval of the responsible highway agency prior to implementation.

Provisions for effective continuity of transit service should be incorporated into the TTC planning process because often public transit buses cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects). Where applicable, the TTC plan should provide for features such as accessible temporary bus stops, pull-outs, and satisfactory waiting areas for transit patrons, including persons with disabilities, if applicable (see Section 10A.05 for additional light rail transit issues to consider for TTC).

Provisions for effective continuity of railroad service and acceptable access to abutting property owners and businesses should also be incorporated into the TTC planning process.

Reduced speed limits should be used only in the specific portion of the TTC zone where conditions or restrictive features are present. However, frequent changes in the speed limit should be avoided. A TTC plan should be designed so that vehicles can reasonably safely travel through the TTC zone with a speed limit reduction of no more than 16 km/h (10 mph).

A reduction of more than 16 km/h (10 mph) in the speed limit should be used only when required by restrictive features in the TTC zone. Where restrictive features justify a speed reduction of more than 16 km/h (10 mph), additional driver notification should be provided. The speed limit should be stepped down in advance of the location requiring the lowest speed, and additional TTC warning devices should be used.

Reduced speed zoning (lowering the regulatory speed limit) should be avoided as much as practical because drivers will reduce their speeds only if they clearly perceive a need to do so.

Support:

Research has demonstrated that large reductions in the speed limit, such as a 50 km/h (30 mph) reduction, increase speed variance and the potential for crashes. Smaller reductions in the speed limit of up to 16 km/h (10 mph) cause smaller changes in speed variance and lessen the potential for increased crashes. A reduction in the regulatory speed limit of only up to 16 km/h (10 mph) from the normal speed limit has been shown to be more effective.

Support:

See Section 2B.116(CA) for more information on speed limits and zones.

See Section 2B.13 for Speed Limit and Speed Zone signs.

See Section 6F.104(CA) for Road Work/Speed Zone (C17(CA)) sign.

Construction Speed Zones:

Construction speed zones are established on roads under construction where reduced speed is necessary to limit the risk of an accident to workers and the traveling public during all hours of the day and night. Protection of workers during working hours is provided for under CVC Section 22362.

Guidance:

Construction speed zones should be avoided if traffic can be controlled by other means. Speed restrictions should be imposed on the public only when necessary for worker or public safety.

Standard:

Where traffic obstructions exist only during the hours of construction, the speed zone signs shall be covered during non-working hours.

Guidance:

The traveled way should be signed and delineated to communicate physical conditions to the motorists such as curvature, narrow roadways, detours, rough roads, dips or humps, etc.

Option:

The Advisory Speed (W13-1) plaque may be used in combination with various warning type signs to decrease speed at a particular location.

Guidance:

To preserve the effectiveness of the W13-1 plaque, it should not be used unless the condition to which it applies is immediate and will be experienced by all motorists.

Option:

Reduced speed limits in construction zones may be established by an engineering analysis, which may include a traffic and engineering survey.

Guidance:

The speed limit should not be lowered more than 16 km/h (10 mph) below the posted or maximum speed.

Option:

If the project falls within an established 105 km/h (65 mph) zone, and a 70 km/h (45 mph) speed limit is considered necessary, it may be posted only if the approaching speed limits are lowered in two stages (i.e., first to a 90 km/h (55 mph) speed limit followed by a reduction to the desired 70 km/h (45 mph).

Guidance:

Speed Limit and End Zone signs should be installed at locations jointly agreed upon by the Traffic Engineer and the Construction Engineer. The speed zone should be verified by an engineering and traffic survey.

Support:

Orders for construction speed zones are ordinarily issued for the entire length of the construction project. This avoids the necessity and resulting delay of obtaining a new order each time the speed restriction signs require relocation to fit the conditions. It is not the intention, however, that the entire length be posted for the duration of the contract.

Standard:

Speed restriction signs shall be posted only in areas where the traveling public is affected by construction operations.

Guidance:

As the construction progresses, signs should be moved as appropriate.

Standard:

Signs shall be removed immediately following completion of the construction or change in the conditions for which they were installed. When the construction is completed or the speed restriction is no longer necessary, the formal speed zone orders shall be revoked.

Section 6C.02 Temporary Traffic Control Zones

Support:

A TTC zone is an area of a highway where road user conditions are changed because of a work zone or an incident through the use of TTC devices, uniformed law enforcement officers, or other authorized personnel.

A work zone is an area of a highway with construction, maintenance, or utility work activities. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the END ROAD WORK sign or the last TTC device.

An incident area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a traffic incident, natural disaster, or special event. It extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where road users return to the original lane alignment and are clear of the incident.

Section 6C.03 Components of Temporary Traffic Control Zones

Support:

Most TTC zones are divided into four areas: the advance warning area, the transition area, the activity area, and the termination area. Figure 6C-1 illustrates these four areas. These four areas are described in Sections 6C.04 through 6C.07.

Section 6C.04 Advance Warning Area

Support:

The advance warning area is the section of highway where road users are informed about the upcoming work zone or incident area.

Option:

The advance warning area may vary from a single sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to a series of signs in advance of the TTC zone activity area.

Guidance:

Typical distances for placement of advance warning signs on freeways and expressways should be longer because drivers are conditioned to uninterrupted flow. Therefore, the advance warning sign placement should extend on these facilities as far as 800 m (0.5 mi) or more.

On urban streets, the effective placement of the first warning sign in meters (feet) should range from 0.75 to 1.5 times the speed limit in km/h (4 to 8 times the speed limit in mph), with the high end of the range being used when speeds are relatively high. When a single advance warning sign is used (in cases such as low-speed residential streets), the advance warning area can be as short as 30 m (100 ft). When two or more advance warning signs are used on higher-speed streets, such as major arterials, the advance warning area should extend a greater distance (see Table 6C-1).

Since rural highways are normally characterized by higher speeds, the effective placement of the first warning sign in meters (feet) should be substantially longer—from 1.5 to 2.25 times the speed limit in km/h (8 to 12 times the speed limit in mph). Since two or more advance warning signs are normally used for these conditions, the advance warning area should extend 450 m (1,500 ft) or more for open highway conditions (see Table 6C-1).

Option:

Advance warning may be eliminated when the activity area is ~~sufficiently removed from the road users' path~~ behind a barrier, more than 600 mm (24 in) behind the curb, or 4.6 m (15 ft) or more from the edge of any roadway so that it does not interfere with the normal flow.

Section 6C.05 Transition Area

Support:

The transition area is that section of highway where road users are redirected out of their normal path. Transition areas usually involve strategic use of tapers, which because of their importance are discussed separately in detail.

Standard:

When redirection of the road users' normal path is required, they shall be channelized from the normal path to a new path.

Support:

In mobile operations, the transition area moves with the work space.

Section 6C.06 Activity Area

Support:

The activity area is the section of the highway where the work activity takes place. It is comprised of the work space, the traffic space, and the buffer space.

The work space is that portion of the highway closed to road users and set aside for workers, equipment, and material, and a shadow vehicle if one is used upstream. Work spaces are usually delineated for road users by channelizing devices or, to exclude vehicles and pedestrians, by temporary barriers.

Option:

The work space may be stationary or may move as work progresses.

Guidance:

Since there might be several work spaces (some even separated by several kilometers or miles) within the project limits, each work space should be adequately signed to inform road users and reduce confusion.

Support:

The traffic space is the portion of the highway in which road users are routed through the activity area.

The buffer space is a lateral and/or longitudinal area that separates road user flow from the work space or an unsafe area, and might provide some recovery space for an errant vehicle.

Guidance:

Neither work activity nor storage of equipment, vehicles, or material should occur within a buffer space.

Option:

Buffer spaces may be positioned either longitudinally or laterally with respect to the direction of road user flow. The activity area may contain one or more lateral or longitudinal buffer spaces.

A longitudinal buffer space may be placed in advance of a work space.

The longitudinal buffer space ~~may also~~ should be used to separate opposing road user flows that use portions of the same traffic lane, as shown in Figure ~~6C-2~~ 6C-2(CA).

If a longitudinal buffer space is used, the values shown in Table 6C-2 may be used to determine the length of the longitudinal buffer space.

Support:

Typically, the buffer space is formed as a traffic island and defined by channelizing devices.

When a shadow vehicle, arrow panel, or changeable message sign is placed in a closed lane in advance of a work space, only the area upstream of the vehicle, arrow panel, or changeable message sign constitutes the buffer space.

Option:

The lateral buffer space may be used to separate the traffic space from the work space, as shown in Figures 6C-1 and ~~6C-2~~ 6C-2(CA), or such areas as excavations or pavement-edge drop-offs. A lateral buffer space also may be used between two travel lanes, especially those carrying opposing flows.

Guidance:

The width of a lateral buffer space should be determined by engineering judgment.

Option:

When work occurs on a high-volume, highly congested facility, a vehicle storage or staging space may be provided for incident response and emergency vehicles (for example, tow trucks and fire apparatus) so that these vehicles can respond quickly to road user incidents.

Guidance:

If used, an incident response and emergency-vehicle storage area should not extend into any portion of the buffer space.

Section 6C.07 Termination Area

Standard:

The termination area shall be used to return road users to their normal path. The termination area shall extend from the downstream end of the work area to the last TTC device such as END ROAD WORK signs, if posted.

Option:

An END ROAD WORK sign, a Speed Limit sign, or other signs may be used to inform road users that they can resume normal operations.

A longitudinal buffer space may be used between the work space and the beginning of the downstream taper.

Section 6C.08 Tapers

Option:

Tapers may be used in both the transition and termination areas. Whenever tapers are to be used in close proximity to an interchange ramp, crossroads, curves, or other influencing factors, the length of the tapers may be adjusted.

Support:

Tapers are created by using a series of channelizing devices and/or pavement markings to move traffic out of or into the normal path. Types of tapers are shown in Figure ~~6C-2~~ 6C-2(CA).

Longer tapers are not necessarily better than shorter tapers (particularly in urban areas with characteristics such as short block lengths or driveways) because extended tapers tend to encourage sluggish operation and to encourage drivers to delay lane changes unnecessarily. The test concerning adequate lengths of tapers involves observation of driver performance after TTC plans are put into effect.

Guidance:

The appropriate taper length (L) should be determined using the criteria shown in Tables 6C-3, ~~and~~ 6C-4 or 6C-3(CA).

The maximum distance in meters (feet) between devices in a taper should not exceed 0.2 times the speed limit in km/h (1.0 times the speed limit in mph).

Support:

A merging taper requires the longest distance because drivers are required to merge into common road space.

Guidance:

A merging taper should be long enough to enable merging drivers to have adequate advance warning and sufficient length to adjust their speeds and merge into a single lane before the end of the transition.

Support:

A shifting taper is used when a lateral shift is needed. When more space is available, a longer than minimum taper distance can be beneficial. Changes in alignment can also be accomplished by using horizontal curves designed for normal highway speeds.

Guidance:

A shifting taper should have a length of approximately 0.5 L (see Tables 6C-3, ~~and~~ 6C-4 or 6C-3(CA)).

Support:

A shoulder taper may be beneficial on a high-speed roadway where shoulders are part of the activity area and are closed, or when improved shoulders might be mistaken as a driving lane. In these instances, the same type, but abbreviated, closure procedures used on a normal portion of the roadway can be used.

Guidance:

If used, shoulder tapers should have a length of approximately 0.33 L (see Tables 6C-3, ~~and~~ 6C-4 or 6C-3(CA).). If a shoulder is used as a travel lane, either through practice or during a TTC activity, a normal merging or shifting taper should be used.

Option:

A downstream taper may be useful in termination areas to provide a visual cue to the driver that access is available back into the original lane or path that was closed.

Guidance:

When used, a downstream taper should have a length of approximately 30 m (100 ft) per lane with devices placed at a spacing of approximately 6.1 m (20 ft).

Support:

The one-lane, two-way taper is used in advance of an activity area that occupies part of a two-way roadway in such a way that a portion of the road is used alternately by traffic in each direction.

Guidance:

Traffic should be controlled by a flagger or temporary traffic control signal (if sight distance is limited), or a STOP or YIELD sign. A short taper having a maximum length of 30 m (100 ft) with channelizing devices at approximately 6.1 m (20 ft) spacings should be used to guide traffic into the one-way section.

Support:

An example of a one-lane, two-way traffic taper is shown in Figure 6C-3.

Standard:

On State highways, Department of Transportation's Standard Plans for Traffic Control Systems (Standard Plans T10 through T17) shall be used. See Section 1A.11 for information regarding this publication.

Section 6C.09 Detours and Diversions

Support:

A detour is a temporary rerouting of road users onto an existing highway in order to avoid a TTC zone.

Guidance:

Detours should be clearly signed over their entire length so that road users can easily use existing highways to return to the original highway.

Support:

A diversion is a temporary rerouting of road users onto a temporary highway or alignment placed around the work area.

Standard:

The detour route shall be evaluated for height, weight, and size restrictions. Appropriate signs shall be posted along the route to advise motorists of any restrictions. Refer to CVC 21363 for detour signs.

Option:

Advance signs may be necessary to give trucks an opportunity to turn around and retrace their path or select another route.

Section 6C.10 One-Lane, Two-Way Traffic Control

Standard:

When traffic in both directions must use a single lane for a limited distance, movements from each end shall be coordinated.

Guidance:

Provisions should be made for alternate one-way movement through the constricted section via methods such as flagger control, a flag transfer, a pilot car, traffic control signals, or stop or yield control.

Control points at each end should be chosen to permit easy passing of opposing lanes of vehicles.

If traffic on the affected one-lane roadway is not visible from one end to the other, then flagging procedures, a pilot car with a flagger used as described in Section 6F.54, or a traffic control signal should be used to control opposing traffic flows.

Support:

At a spot constriction, such as an isolated pavement patch on highways with lower speeds and adequate sight distance, the movement of traffic through one-lane, two-way constrictions tends to be self-regulating.

Section 6C.11 Flagger Method of One-Lane, Two-Way Traffic Control

Option:

When a one-lane, two-way TTC zone is short enough to allow a flagger to see from one end of the zone to the other, traffic may be controlled by either a single flagger or by a flagger at each end of the section.

Guidance:

When a single flagger is used, the flagger should be stationed on the shoulder opposite the constriction or work space, or in a position where good visibility and traffic control can be maintained at all times. When good visibility and traffic control cannot be maintained by one flagger station, traffic should be controlled by a flagger at each end of the section. One of the flaggers should be designated as the coordinator. Flaggers should be able to communicate with each other orally, electronically, or with manual signals. These manual signals should not be mistaken for flagging signals.

Section 6C.12 Flag Transfer Method of One-Lane, Two-Way Traffic Control

Support:

The driver of the last vehicle proceeding into the one-lane section is given a red flag (or other token) and instructed to deliver it to the flagger at the other end. The opposite flagger, upon receipt of the flag, then knows that it is reasonably safe to allow traffic to move in the other direction. A variation of this method is to replace the use of a flag with an official pilot car that always follows the last road user vehicle proceeding through the section.

Guidance:

The flag transfer method should be employed only where the one-way traffic is confined to a relatively short length of a road, usually not more than 1.6 km (1 mi) in length.

Section 6C.13 Pilot Car Method of One-Lane, Two-Way Traffic Control

Option:

A pilot car may be used to guide a queue of vehicles through the TTC zone or detour.

Guidance:

The operation of the pilot vehicle should be coordinated with flagging operations or other controls at each end of the one-lane section. The pilot car should have the name of the contractor or contracting authority prominently displayed.

Standard:

The PILOT CAR FOLLOW ME (G20-4) sign (see Figure 6F-4, Sheet 4 of 4) shall be mounted at a conspicuous location on the rear of the vehicle.

Option:

Two or more pilot cars may be used to guide two-way traffic through a particularly complex detour.

Section 6C.14 Temporary Traffic Control Signal Method of One-Lane, Two-Way Traffic Control

Option:

Traffic control signals may be used to control vehicular traffic movements in one-lane, two-way TTC zones (see Figure ~~6H-12~~ 6H-12(CA) and Chapter 4G).

Section 6C.15 Stop or Yield Control Method of One-Lane, Two-Way Traffic Control

Option:

STOP or YIELD signs may be used to control traffic on low-volume roads at a one-lane, two-way TTC zone when drivers are able to see the other end of the one-lane, two-way operation and have sufficient visibility of approaching vehicles.

Guidance:

If the STOP or YIELD sign is installed for only one direction, then the STOP or YIELD sign should face road users who are driving on the side of the roadway that is closed for the work activity area.

Standard:

The approach to the side that is not closed shall be visible (for a distance equal to the safe passing sight distance for that approach) to the driver who must yield or stop.

Support:

See Section 3B.02 and Figure 6H-11.

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Figure 6C-1. Component Parts of a Temporary Traffic Control Zone

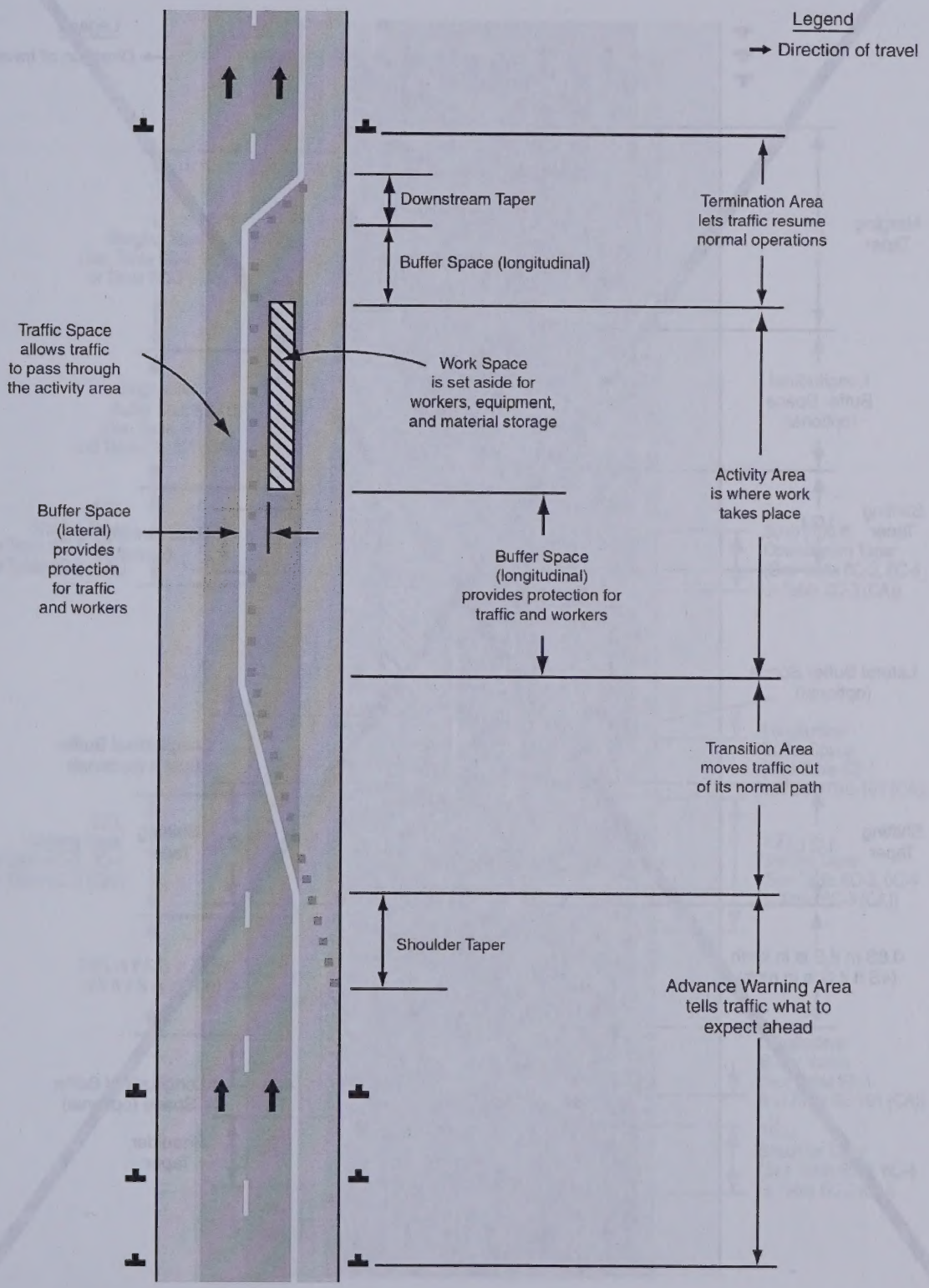
Legend
Direction of travel
Downstream Taper
Buffer Space (longitudinal)
Termination Area lets traffic resume normal operations
Traffic Space allows traffic to pass through the activity area
Work Space is set aside for workers, equipment, and material storage
Activity Area is where work takes place
Buffer Space (lateral) provides protection for traffic and workers
Buffer Space (longitudinal) provides protection for traffic and workers
Transition Area moves traffic out of its normal path
Shoulder Taper
Advance Warning Area tells traffic what to expect ahead

Figure 6C-2. Types of Tapers and Buffer Spaces

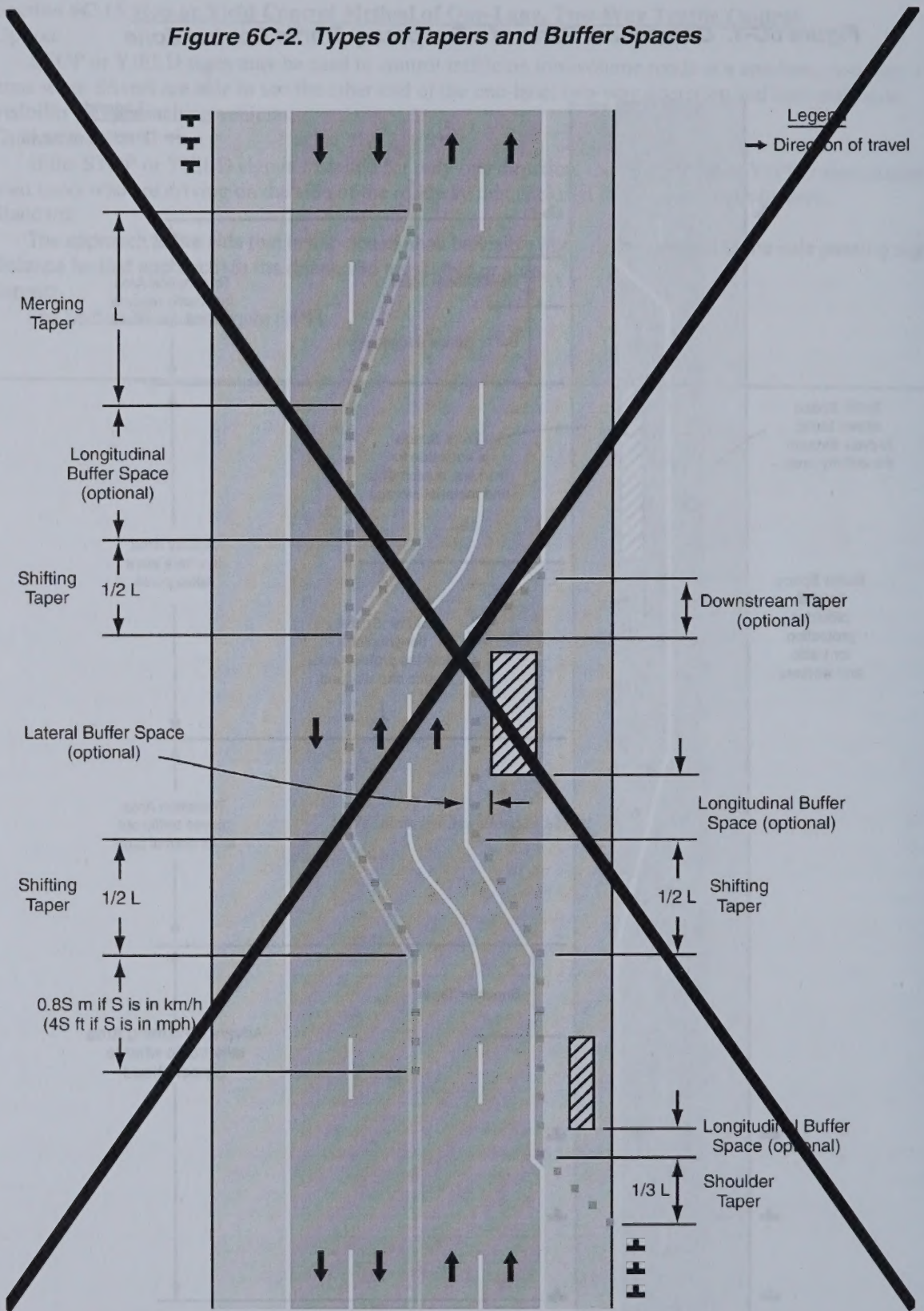

Figure 6C-2 (CA). Types of Tapers and Buffer Spaces

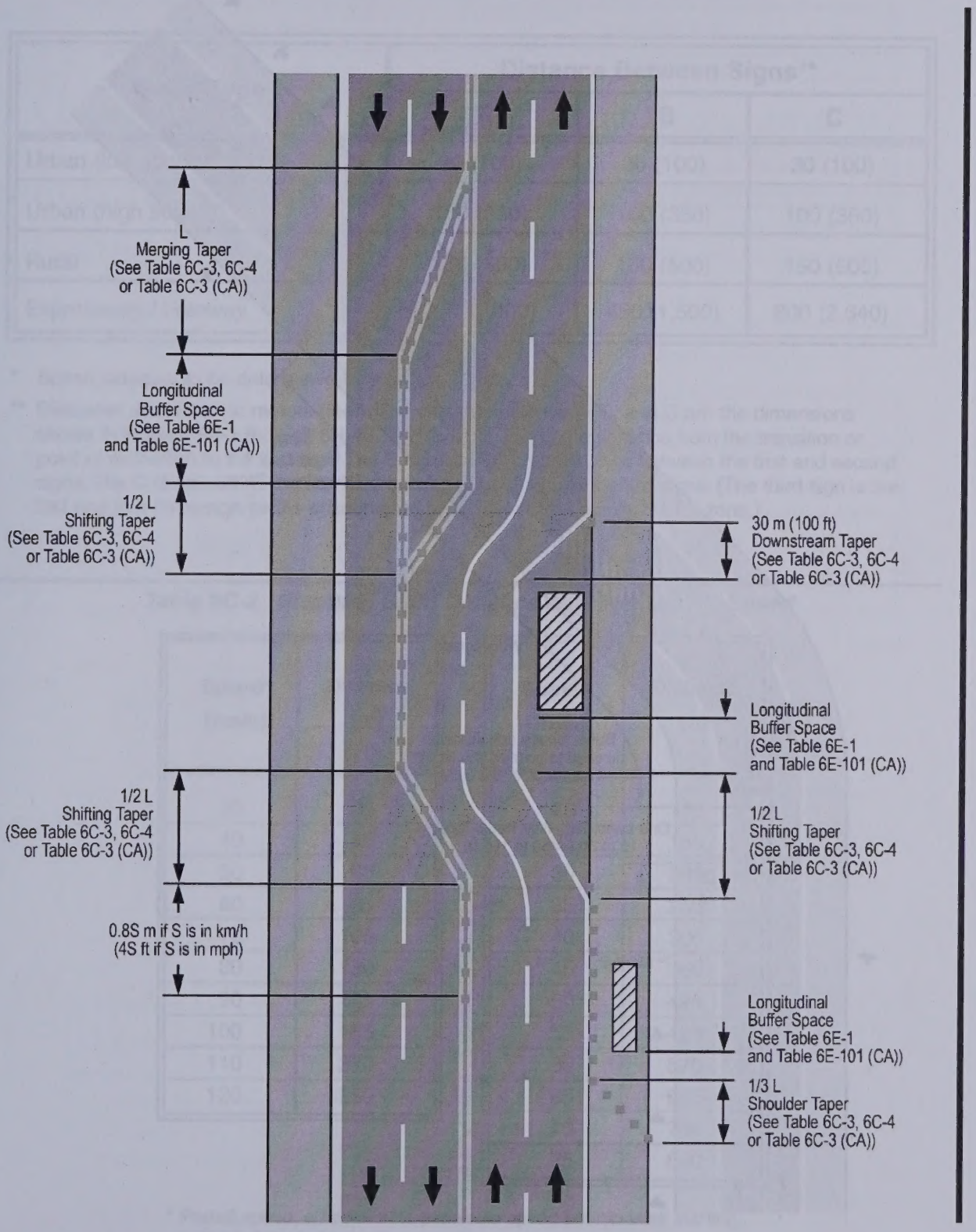

Figure 6C-3. Example of a One-Lane, Two-Way Traffic Taper

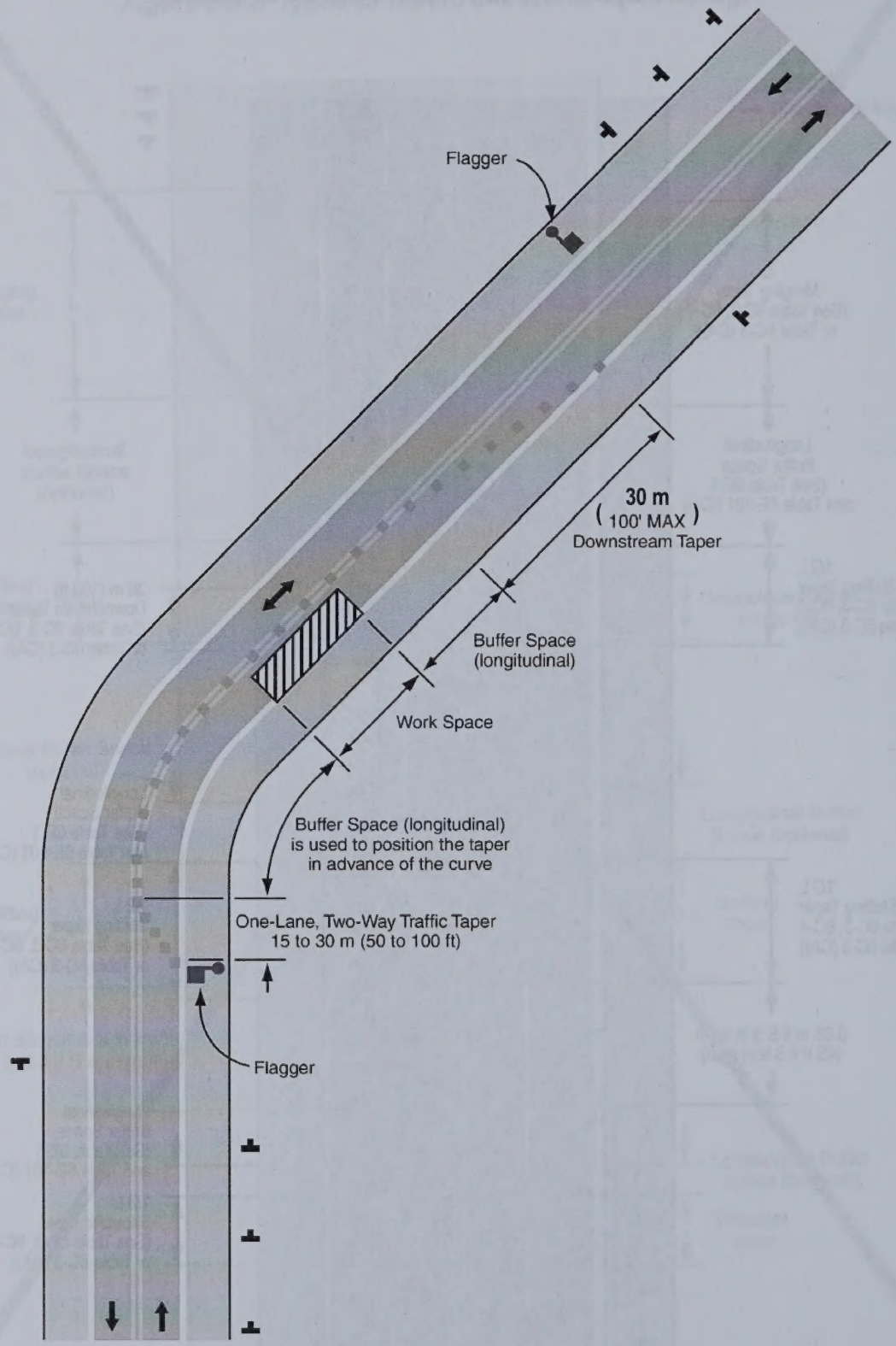

Table 6C-1. Suggested Advance Warning Sign Spacing

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	30 (100)	30 (100)	30 (100)
Urban (high speed)*	100 (350)	100 (350)	100 (350)
Rural	150 (500)	150 (500)	150 (500)
Expressway / Freeway	300 (1,000)	450 (1,500)	800 (2,640)

* Speed category to be determined by highway agency

** Distances are shown in meters (feet). The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The third sign is the first one in a three-sign series encountered by a driver approaching a TTC zone.)

Table 6C-2. Stopping Sight Distance as a Function of Speed

Speed* (km/h)	Distance (m)
30	35
40	50
50	65
60	85
70	105
80	130
90	160
100	185
110	220
120	250

Speed* (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length (L)*
Merging Taper	at least L
Shifting Taper	at least 0.5L
Shoulder Taper	at least 0.33L
One-Lane, Two-Way Traffic Taper	30 m (100 ft) maximum
Downstream Taper	30 m (100 ft) per lane

Table 6C-4. Formulas for Determining Taper Lengths

Speed Limit (S)	Taper Length (L) Meters
60 km/h or less	$L = \frac{WS^2}{155}$
70 km/h or more	$L = \frac{WS}{1.6}$

Speed Limit (S)	Taper Length (L) Feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in meters (feet)
W = width of offset in meters (feet)
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in km/h (mph)

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Table 6C-3(CA). Taper Length Criteria for Temporary Traffic Control Zones for 3.6 m (12 ft) Offset Width

Speed* S (km/h)	Minimum Taper Length** for Width of Offset 3.6 m (W)			
	Merging L (m)	Shifting L/2 (m)	Shoulder L/3 (m)	Down Stream (m)
30	21	10	7	30
40	37	19	12	30
50	58	29	19	30
60	84	42	28	30
70	158	79	53	30
80	180	90	60	30
90	203	101	68	30
100	225	113	75	30
110	248	124	83	30

Speed* S (mph)	Minimum Taper Length** for Width of Offset 12 ft (W)			
	Merging L (ft)	Shifting L/2 (ft)	Shoulder L/3 (ft)	Down Stream (ft)
20	80	40	27	100
25	125	63	42	100
30	180	90	60	100
35	245	123	82	100
40	320	160	107	100
45	540	270	180	100
50	600	300	200	100
55	660	330	220	100
60	720	360	240	100
65	780	390	260	100
70	840	420	280	100

* - Posted Speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed.

** - For other offsets use the following merging taper length formula for L:

For speeds of 65 km/h (40 mph) or less, L=WSS/155 (L=WSS/60)

For speeds of 70 km/h (45 mph) or more, L=WS/1.6 (L=WS)

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CHAPTER 6D. PEDESTRIAN AND WORKER SAFETY

Section 6D.01 Pedestrian Considerations

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

A wide range of pedestrians might be affected by TTC zones, including the young, elderly, and people with disabilities such as hearing, visual, or mobility. These pedestrians need a clearly delineated and usable travel path. Considerations for pedestrians with disabilities are addressed in Section 6D.02.

The most desirable way to provide information to pedestrians with visual disabilities that is equivalent to visual signage for notification of sidewalk closures is a speech message provided by an audible information device. Devices that provide speech messages in response to passive pedestrian actuation are the most desirable. Other devices that continuously emit a message, or that emit a message in response to use of a pushbutton, are also acceptable. Signage information can also be transmitted to personal receivers, but currently such receivers are not likely to be carried or used by pedestrians with visual disabilities in TTC zones. Audible information devices might not be needed if detectable channelizing devices make an alternate route of travel evident to pedestrians with visual disabilities.

Guidance:

If a pushbutton is used to provide equivalent TTC information to pedestrians with visual disabilities, the pushbutton should be equipped with a locator tone to notify pedestrians with visual disabilities that a special accommodation is available, and to help them locate the pushbutton.

Standard:

The various TTC provisions for pedestrian and worker safety set forth in Part 6 shall be applied by knowledgeable (for example, trained and/or certified) persons after appropriate evaluation and engineering judgment.

Advance notification of sidewalk closures shall be provided to the maintaining agency. Where pedestrians with visual disabilities normally use the closed sidewalk, a barrier that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.

Support:

It must be recognized that pedestrians are reluctant to retrace their steps to a prior intersection for a crossing or to add distance or out-of-the-way travel to a destination.

Guidance:

Adequate provisions should be made for persons with disabilities as determined by an engineering study or by engineering judgment. Because printed signs and surface delineation are not usable by pedestrians with visual disabilities, blocked routes, alternate crossings, and sign and signal information should be communicated to pedestrians with visual disabilities by providing audible information devices, accessible pedestrian signals, and barriers and channelizing devices that are detectable to pedestrians traveling with the aid of a long cane or who have low vision.

The following three items should be considered when planning for pedestrians in TTC zones:

A. Pedestrians should not be led into conflicts with work site vehicles, equipment, and operations.
B. Pedestrians should not be led into conflicts with vehicles moving through or around the work site.
C. Pedestrians should be provided with a reasonably safe, convenient, and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s). Where pedestrians who have visual disabilities encounter work sites that require them to cross the roadway to find an accessible route, instructions should be provided using an audible information device. Accessible pedestrian signals (see Section 4E.06) with accessible pedestrian detectors (see

Section 4E.09) might be needed to enable pedestrians with visual disabilities to cross wide or heavily traveled roadways.

A pedestrian route should not be severed and/or moved for nonconstruction activities such as parking for vehicles and equipment.

Consideration should be made to separate pedestrian movements from both work site activity and vehicular traffic. Unless a reasonably safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

Support:

Figures 6H-28 and 6H-29 show typical TTC device usage and techniques for pedestrian movement through work zones.

Guidance:

When pedestrian movement through or around a work site is necessary, a separate usable footpath should be provided. If the previous pedestrian facility was accessible to pedestrians with disabilities, the footpath provided during temporary traffic control should also be accessible. There should not be any abrupt changes in grade or terrain that could cause a tripping hazard or could be a barrier to wheelchair use. Barriers and channelizing devices should be detectable to pedestrians who have visual disabilities (see Section 6F.68).

Option:

Whenever it is feasible, closing off the work site from pedestrian intrusion may be preferable to channelizing pedestrian traffic along the site with TTC devices.

Support:

Maintaining a detectable, channelized pedestrian route is much more useful to pedestrians who have visual disabilities than closing a walkway and providing audible directions to an alternate route involving additional crossings and a return to the original route. Braille is not useful in conveying such information because it is difficult to find. Audible instructions might be provided, but the extra distance and additional street crossings might add complexity to a trip.

Guidance:

Fencing should not create sight distance restrictions for road users. Fences should not be constructed of materials that would be hazardous if impacted by vehicles.

Wooden railing, fencing, and similar systems placed immediately adjacent to motor vehicle traffic should not be used as substitutes for crashworthy temporary traffic barriers.

Standard:

TTC devices used to delineate a TTC zone pedestrian walkway shall be crashworthy and, when struck by vehicles, present a minimum threat to pedestrians, workers, and occupants of impacting vehicles.

Guidance:

Ballast for TTC devices should be kept to the minimum amount needed and should be mounted low to prevent penetration of the vehicle windshield.

Movement by work vehicles and equipment across designated pedestrian paths should be minimized and, when necessary, should be controlled by flaggers or TTC. Staging or stopping of work vehicles or equipment along the side of pedestrian paths should be avoided, since it encourages movement of workers, equipment, and materials across the pedestrian path.

Access to the work space by workers and equipment across pedestrian walkways should be minimized because the access often creates unacceptable changes in grade, and rough or muddy terrain, and pedestrians will tend to avoid these areas by attempting nonintersection crossings where no curb ramps are available.

Option:

A canopied walkway may be used to protect pedestrians from falling debris, and to provide a covered passage for pedestrians.

Guidance:

Covered walkways should be sturdily constructed and adequately lighted for nighttime use.

When pedestrian and vehicle paths are rerouted to a closer proximity to each other, consideration should be given to separating them by a temporary traffic barrier.

If a temporary traffic barrier is used to shield pedestrians, it should be designed to accommodate site conditions.

Support:

Depending on the possible vehicular speed and angle of impact, temporary traffic barriers might deflect upon impact by an errant vehicle. Guidance for locating and designing temporary traffic barriers can be found in Chapter 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11).

Standard:

Short intermittent segments of temporary traffic barrier shall not be used because they nullify the containment and redirective capabilities of the temporary traffic barrier, increase the potential for serious injury both to vehicle occupants and pedestrians, and encourage the presence of blunt, leading ends. All upstream leading ends that are present shall be appropriately flared or protected with properly installed and maintained crashworthy cushions. Adjacent temporary traffic barrier segments shall be properly connected in order to provide the overall strength required for the temporary traffic barrier to perform properly.

Normal vertical curbing shall not be used as a substitute for temporary traffic barriers when temporary traffic barriers are clearly needed.

Option

Temporary traffic barriers or longitudinal channelizing devices may be used to discourage pedestrians from unauthorized movements into the work space. They may also be used to inhibit conflicts with vehicular traffic by minimizing the possibility of midblock crossings.

Support:

A major concern for pedestrians is urban and suburban building construction encroaching onto the contiguous sidewalks, which forces pedestrians off the curb into direct conflict with moving vehicles.

Guidance:

If a significant potential exists for vehicle incursions into the pedestrian path, pedestrians should be rerouted or temporary traffic barriers should be installed.

Support:

TTC devices, jersey barriers, and wood or chainlink fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.

Guidance:

Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11), and should not be used as a control for pedestrian movements.

The extent of pedestrian needs should be determined through engineering judgment for each TTC zone situation. In general, pedestrian routes should be preserved in urban and commercial suburban areas. Alternative routing should be discouraged.

The highway agency in charge of the TTC zone should regularly inspect the activity area so that effective pedestrian TTC is maintained.

Section 6D.02 Accessibility Considerations

Support:

Additional information on the design and construction of accessible temporary facilities is found in publications listed in Section 1A.11 (see Documents 10 and 29 through 31).

Guidance:

The extent of pedestrian needs should be determined through engineering judgment or by the individual responsible for each TTC zone situation. This individual should be aware that the absence of a continuous pathway, including curb ramps and other accessible features, might preclude the use of the facility by pedestrians with disabilities.

Standard:

When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

Guidance:

To accommodate the needs of pedestrians, including those with disabilities, the following considerations should be addressed when temporary pedestrian pathways in TTC zones are designed or modified:

A. Provisions for continuity of accessible paths for pedestrians should be incorporated into the TTC process. Pedestrians should be provided with a reasonably safe, convenient, and accessible path that replicates as much as practical the desirable characteristics of the existing pedestrian facilities.
B. Access to temporary transit stops should be provided.
C. Blocked routes, alternate crossings, and sign and signal information should be communicated to pedestrians with visual disabilities by providing devices such as audible information devices, accessible pedestrian signals, or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a long cane or who have low vision. Where pedestrian traffic is detoured to a TTC signal, engineering judgment should be used to determine if pedestrian signals or accessible pedestrian signals should be considered for crossings along an alternate route.
D. When channelization is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the length of the facility such that pedestrians using a long cane can follow it. These detectable edgings should adhere to the provisions of Section 6F.68.
E. A smooth, continuous hard surface should be provided throughout the entire length of the temporary pedestrian facility. There should be no curbs or abrupt changes in grade or terrain that could cause tripping or be a barrier to wheelchair use. The geometry and alignment of the facility should meet the applicable requirements of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11).
F. The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable width of the sidewalk, temporary pathway, or other pedestrian facility. When it is not possible to maintain a minimum width of 1500 mm (60 in) throughout the entire length of the pedestrian pathway, a 1500 x 1500 mm (60 x 60 in) passing space should be provided at least every 60 m (200 ft), to allow individuals in wheelchairs to pass.
G. Signs and other devices mounted lower than 2.1 m (7 ft) above the temporary pedestrian pathway should not project more than 100 mm (4 in) into accessible pedestrian facilities.

Section 6D.03 Worker Safety Considerations

Support:

Equally as important as the safety of road users traveling through the TTC zone is the safety of workers. TTC zones present temporary and constantly changing conditions that are unexpected by the road user. This creates an even higher degree of vulnerability for workers on or near the roadway.

Maintaining TTC zones with road user flow inhibited as little as possible, and using TTC devices that get the road user's attention and provide positive direction are of particular importance. Likewise, equipment and vehicles moving within the activity area create a risk to workers on foot. When possible, the separation of moving equipment and construction vehicles from workers on foot provides the operator of these vehicles with a greater separation clearance and improved sight lines to minimize exposure to the hazards of moving vehicles and equipment.

Guidance:

The following are the key elements of worker safety and TTC management that should be considered to improve worker safety:

A. Training—all workers should be trained on how to work next to motor vehicle traffic in a way that minimizes their vulnerability. Workers having specific TTC responsibilities should be trained in TTC techniques, device usage, and placement.

B. Worker Safety Apparel—all workers exposed to the risks of moving roadway traffic or construction equipment should wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Safety Apparel" (see Section 1A.11), or equivalent revisions, and labeled as ANSI 107-1999 standard performance for Class 1, 2, or 3 risk exposure. A competent person designated by the employer to be responsible for the worker safety plan within the activity area of the job site should make the selection of the appropriate class of garment. Refer to Construction Safety Order in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 4, Article 3, Section 1523 - Illumination). See See Section 1A.11 for information regarding this publication.

C. Temporary Traffic Barriers—temporary traffic barriers should be placed along the work space depending on factors such as lateral clearance of workers from adjacent traffic, speed of traffic, duration and type of operations, time of day, and volume of traffic.

D. Speed Reduction—reducing the speed of vehicular traffic, mainly through regulatory speed zoning, funneling, lane reduction, or the use of uniformed law enforcement officers or flaggers, should be considered. The use of regulatory speed zone signing tends to be more effective when law enforcement is present.

E. Activity Area—planning the internal work activity area to minimize backing-up maneuvers of construction vehicles should be considered to minimize the exposure to risk.

F. Worker Safety Planning—a competent person designated by the employer should conduct a basic hazard assessment for the work site and job classifications required in the activity area. This safety professional should determine whether engineering, administrative, or personal protection measures should be implemented. This plan should be in accordance with the Occupational Safety and Health Act of 1970, as amended, "General Duty Clause" Section 5(a)(1) - Public Law 91-596, 84 Stat. 1590, December 29, 1970, as amended, and with the requirement to assess worker risk exposures for each job site and job classification, as per 29 CFR 1926.20 (b)(2) of "Occupational Safety and Health Administration Regulations, General Safety and Health Provisions " (see Section 1A.11).

Option:

The following are additional elements of TTC management that may be considered to improve worker safety:

A. Shadow Vehicle—in the case of mobile and constantly moving operations, such as pothole patching and striping operations, a shadow vehicle, equipped with appropriate lights and warning signs, may be used to protect the workers from impacts by errant vehicles. The shadow vehicle may be equipped with a rear-mounted impact attenuator.

B. Road Closure—if alternate routes are available to handle road users, the road may be closed temporarily. This may also facilitate project completion and thus further reduce worker vulnerability.

C. Law Enforcement Use—in highly vulnerable work situations, particularly those of relatively short duration, law enforcement units may be stationed to heighten the awareness of passing vehicular traffic and to improve safety through the TTC zone.

D. Lighting—for nighttime work, the TTC zone and approaches may be lighted. Care should be taken to ensure that the lighting used for nighttime work does not cause blinding. Refer to CVC 21466.5 for light impairing driver's vision.

E. Special Devices—these include rumble strips, changeable message signs, hazard identification beacons, flags, and warning lights. Intrusion warning devices may be used to alert workers to the approach of errant vehicles.

F. Public Information - Improved driver performance may be realized through a well-prepared and complete public relations effort that covers the nature of the work, the time and duration of its execution, its anticipated effects on traffic, and possible alternate routes and modes of travel. Such programs can encourage the use of alternate routes, thus allowing consideration of temporary lane closures for additional buffer space.

Support:

Judicious use of the special devices described in Item E above might be helpful for certain difficult TTC situations, but misuse or overuse of special devices or techniques might lessen their effectiveness.

Section 6D.101(CA) Bicycle Considerations

Support:

There are several considerations in planning for bicyclists in TTC zones on highways and streets:

- A travel route that replicates the most desirable characteristics of a wide paved shoulder or bikeway through or around the traffic control zone is desirable for bicyclists.
- If the traffic control zone interrupts the continuity of an existing bikeway system, signs directing bicyclists through or around the zone and back to the bikeway is desirable.
- Unless a separate bike path through or around the traffic control zone is provided, adequate roadway lane width to allow bicyclists and motor vehicles to travel side by side through or around the zone is desirable.
- Bicyclists should not be led into direct conflicts with mainline traffic, work site vehicles, or equipment moving through or around the traffic control zone.

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CHAPTER 6E. FLAGGER CONTROL

Section 6E.01 Qualifications for Flaggers

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

A flagger shall be a person who provides TTC.

Guidance:

Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in safe traffic control practices and public contact techniques. Flaggers should be able to satisfactorily demonstrate the following abilities:

A. Ability to receive and communicate specific instructions clearly, firmly, and courteously;
B. Ability to move and maneuver quickly in order to avoid danger from errant vehicles;
C. Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations;
D. Ability to understand and apply safe traffic control practices, sometimes in stressful or emergency situations; and
E. Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

Support:

Refer to Construction Safety Order in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 4, Article 3, Section 1599 - Flaggers) for flagger training. See See Section 1A.11 for information regarding this publication.

Section 6E.02 High-Visibility Safety Apparel

Standard:

For daytime and nighttime activity, flaggers shall wear safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" (see Section 1A.11) and labeled as meeting the ANSI 107-1999 standard performance for Class 2 risk exposure. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green as defined in the standard. The retroreflective material shall be either orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 300 m (1,000 ft). The retroreflective safety apparel shall be designed to clearly identify the wearer as a person.

Guidance:

For nighttime activity, safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" (see Section 1A.11) and labeled as meeting the ANSI 107-1999 standard performance for Class 3 risk exposure should be considered for flagger wear (instead of the Class 2 safety apparel in the Standard above).

When uniformed law enforcement officers are used, high-visibility safety apparel as described in this Section should be worn by the law enforcement officer.

Standard:

The retroreflective clothing, or the retroreflective material added to the clothing, shall have a minimum of one horizontal stripe around the torso.

Option:

White outer garments with retroreflective material may be worn during hours of darkness in lieu of colored vests, jackets and/or shirts.

Section 6E.03 Hand-Signaling Devices

Support:

Hand-signaling devices, such as STOP/SLOW paddles, lights, and red flags, are used to control road users through TTC zones.

Guidance:

The STOP/SLOW paddle ~~should~~ **shall** be the primary and preferred hand-signaling device because the STOP/SLOW paddle gives road users more positive guidance than red flags. Use of flags ~~should~~ **shall** be limited to emergency situations.

Standard:

The STOP/SLOW paddle shall have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 450 mm (18 in) wide with letters at least 150 mm (6 in) high and should be fabricated from light semirigid material. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border. When used at night, the STOP/SLOW paddle shall be retroreflectorized.

Option:

The STOP/SLOW paddle may be modified to improve conspicuity by incorporating ~~either~~ white ~~or red~~ flashing lights on the STOP face, and either white or yellow flashing lights on the SLOW face. The flashing lights may be arranged in any of the following patterns:

A. Two white ~~or red~~ lights, one centered vertically above and one centered vertically below the STOP legend; and/or two white or yellow lights, one centered vertically above and one centered vertically below the SLOW legend; or
B. Two white ~~or red~~ lights, one centered horizontally on each side of the STOP legend; and/or two white or yellow lights, one centered horizontally on each side of the SLOW legend; or
C. One white ~~or red~~ light centered below the STOP legend; and/or one white or yellow light centered below the SLOW legend; or
D. A series of eight or more small white ~~or red~~ lights no larger than 6 mm (0.25 in) in diameter along the outer edge of the paddle, arranged in an octagonal pattern at the eight corners of the border of the STOP face; and/or a series of eight or more small white or yellow lights no larger than 6 mm (0.25 in) in diameter along the outer edge of the paddle, arranged in a diamond pattern along the border of the SLOW face.
E. A series of white lights forming the shapes of the letters in the legend.

Standard:

If flashing lights are used on the STOP face of the paddle, their colors shall be all white ~~or all red~~. If flashing lights are used on the SLOW face of the paddle, their colors shall be all white or all yellow.

If more than eight flashing lights are used, the lights shall be arranged such that they clearly convey the octagonal shape of the STOP face of the paddle and/or the diamond shape of the SLOW face of the paddle.

If flashing lights are used on the STOP/SLOW paddle, the flash rate shall be at least 50, but not more than 60, flashes per minute.

Flags, when used, shall be a minimum of 600 mm (24 in) square, made of a good grade of red material, and securely fastened to a staff that is approximately 900 mm (36 in) in length.

Guidance:

The free edge of a flag should be weighted so the flag will hang vertically, even in heavy winds.

Standard:

When used at nighttime, flags shall be retroreflectorized red.

Option:

The STOP/SLOW (C28A(CA) and C28B(CA)) paddle may be used with either a 300 mm (12 in) short handle or 1650 mm (66 in) long handle.

The 600 x 600 mm (24 x 24 in) size of the STOP/SLOW paddle may be used where greater emphasis is needed and speeds are 50 km/h (30 mph) or more.

Support:

Details for the short and long handle of the STOP/SLOW paddle are shown in Department of Transportation's California Sign Specifications under C28C(CA) code.

Section 6E.04 Flagger Procedures

Support:

The use of paddles and flags by flaggers is illustrated in Figure 6E-1.

Standard:

The following methods of signaling with paddles shall be used:

A. To stop road users, the flagger shall face road users and aim the STOP paddle face toward road users in a stationary position with the arm extended horizontally away from the body. The free arm shall be held with the palm of the hand above shoulder level toward approaching traffic.

B. To direct stopped road users to proceed, the flagger shall face road users with the SLOW paddle face aimed toward road users in a stationary position with the arm extended horizontally away from the body. The flagger shall motion with the free hand for road users to proceed.

C. To alert or slow traffic, the flagger shall face road users with the SLOW paddle face aimed toward road users in a stationary position with the arm extended horizontally away from the body.

Option:

To further alert or slow traffic, the flagger holding the SLOW paddle face toward road users may motion up and down with the free hand, palm down.

Standard:

The following methods of signaling with a flag shall be used:

A. To stop road users, the flagger shall face road users and extend the flag staff horizontally across the road users' lane in a stationary position so that the full area of the flag is visibly hanging below the staff. The free arm shall be held with the palm of the hand above the shoulder level toward approaching traffic.

B. To direct stopped road users to proceed, the flagger shall stand parallel to the road user movement and with flag and arm lowered from the view of the road users, and shall motion with the free hand for road users to proceed. Flags shall not be used to signal road users to proceed.

C. To alert or slow traffic, the flagger shall face road users and slowly wave the flag in a sweeping motion of the extended arm from shoulder level to straight down without raising the arm above a horizontal position. The flagger shall keep the free hand down.

Section 6E.05 Flagger Stations

Standard:

Flagger stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point.

Option:

The distances shown in Table 6E-1, which provides information regarding the stopping sight distance as a function of speed, may be used for the location of a flagger station. These distances may be increased for downgrades and other conditions that affect stopping distance.

Guidance:

Flagger stations should be located such that an errant vehicle has additional space to stop without entering the work space.

Standard:

Except in emergency situations, flagger stations shall be preceded by an advance warning sign or signs. Except in emergency situations, flagger stations shall be illuminated at night.

Support:

Refer to Construction Safety Orders in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 4, Article 3, Section 1523 – Illumination and Section 1599 - Flaggers). See Section 1A.11 for information regarding this publication.

Guidance:

The flagger should stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users. A flagger should only stand in the lane being used by moving road users after road users have stopped. The flagger should be clearly visible to the first approaching road user at all times. The flagger also should be visible to other road users. The flagger should be stationed sufficiently in advance of the workers to warn them (for example, with audible warning devices such as horns or whistles) of approaching danger by out-of-control vehicles. The flagger should stand alone, never permitting a group of workers to congregate around the flagger station.

Option:

At a spot constriction, the flagger may have to take a position on the shoulder opposite the closed section in order to operate effectively.

At spot lane closures where adequate sight distance is available for the reasonably safe handling of traffic, the use of one flagger may be sufficient.

Option:

The distances shown in Table 6E-1 may be increased for downgrades, as shown in Table 6E-101(CA).

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Figure 6E-1. Use of Hand-Signaling Devices by Flaggers

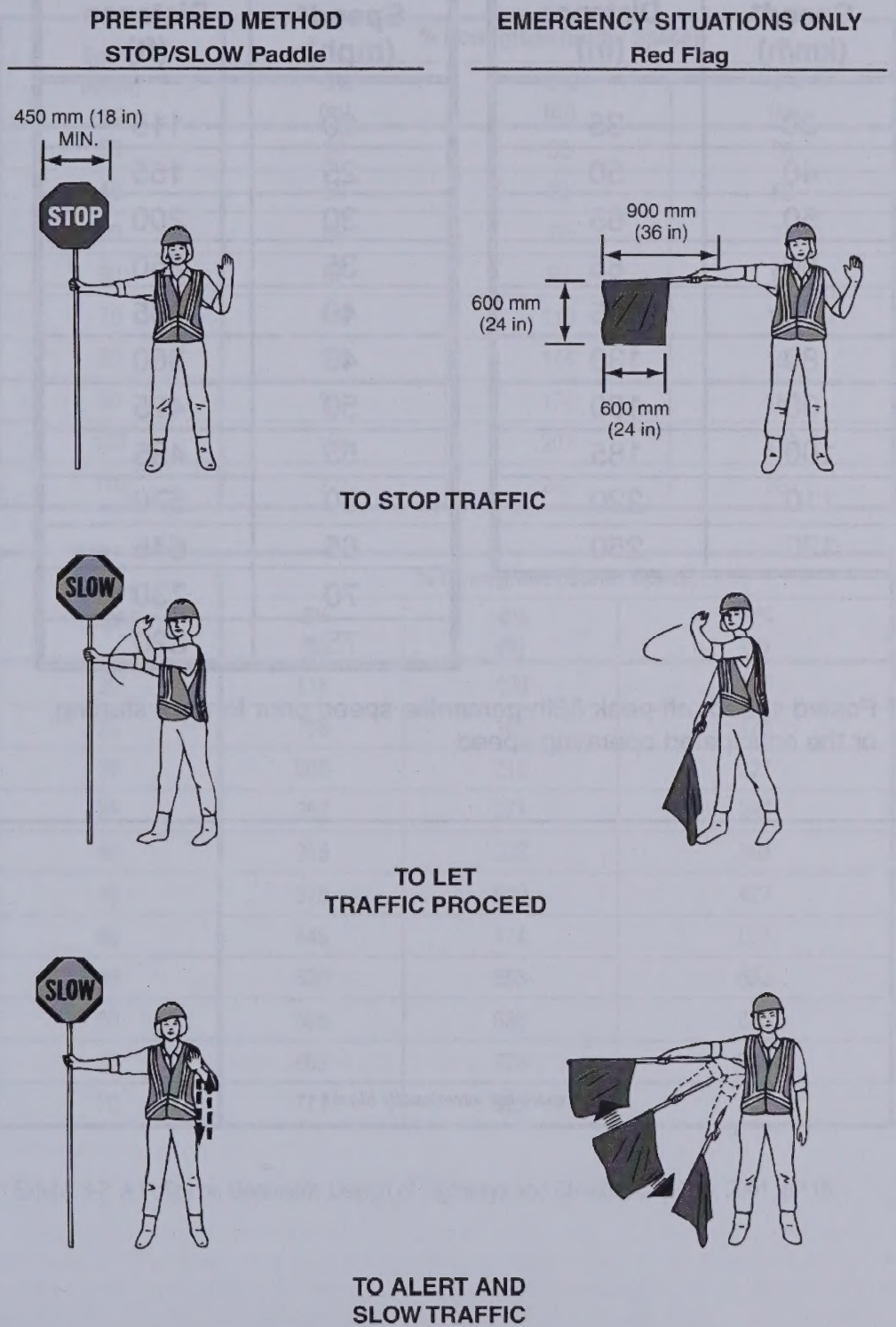

Table 6E-1. Stopping Sight Distance as a Function of Speed

Speed* (km/h)	Distance (m)
30	35
40	50
50	65
60	85
70	105
80	130
90	160
100	185
110	220
120	250

Speed* (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

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Table 6E-101(CA). Longitudinal Buffer Space on Downgrades*

Speed (km/h)	% Downgrade (Buffer Space)		
	-3% (m)	-6% (m)	-9% (m)
30	35	35	35
40	50	50	53
50	66	70	74
60	87	92	97
70	110	116	124
80	136	144	154
90	164	174	187
100	194	207	223
110	227	243	262

Speed (mph)	% Downgrade (Buffer Space)		
	-3% (ft)	-6% (ft)	-9% (ft)
20	116	120	126
25	158	165	173
30	205	215	227
35	257	271	287
40	315	333	354
45	378	400	427
50	446	474	507
55	520	553	593
60	598	638	686
65	682	728	785
70	771	825	891

* Exhibit 3-2. A Policy on Geometric Design of Highways and Streets, AASHTO, 2001, p.115.

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CHAPTER 6F. TEMPORARY TRAFFIC CONTROL ZONE DEVICES

Section 6F.01 Types of Devices

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Guidance:

The design and application of TTC devices used in TTC zones should consider the needs of all road users (motorists, bicyclists, and pedestrians), including those with disabilities.

Support:

FHWA policy requires that all roadside appurtenances such as traffic barriers, barrier terminals and crash cushions, bridge railings, sign and light pole supports, and work zone hardware used on the National Highway System meet the crashworthy performance criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features". The FHWA website at "http://safety.fhwa.dot.gov/programs/roadside_hardware.htm" identifies all such hardware and includes copies of FHWA acceptance letters for each of them. In the case of proprietary items, links are provided to manufacturers' websites as a source of detailed information on specific devices. The website also contains an "Ask the Experts" section where questions on roadside design issues can be addressed. State Departments of Transportation and local agencies might also have expanded the NCHRP Report 350 crashworthy criteria to apply to other highways in addition to the National Highway System.

Crashworthiness and crash testing information on devices described in Part 6 are found in AASHTO's "Roadside Design Guide" (see Section 1A.11).

As stated in Definition 17 in Section 1A.13, "crashworthy" is a characteristic of a roadside appurtenance that has been successfully crash tested in accordance with a national standard such as the National Cooperative Highway Research Program Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Standard:

Traffic control devices shall be defined as all signs, signals, markings, and other devices used to regulate, warn, or guide road users, placed on, over, or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public body or official having jurisdiction.

All traffic control devices used on street and highway construction, maintenance, utility, or incident management operations shall conform to the applicable provisions of this Manual.

The Department of Transportation shall implement NCHRP 350 criteria for crashworthy TTC devices in TTC zones on all State highways effective as of December 1, 2005. Crashworthiness of TTC devices shall be substantiated. When no longer needed, TTC devices shall be removed from the TTC zone.

Crashworthiness of TTC devices shall be substantiated as follows:

Category 1 devices purchased after October 1, 1998 shall be employed based on the vendor's self-certification. Self-certification shall be based on crash testing, crash testing of similar devices, or years of demonstrable safe performance.

Category 2 devices shall be on FHWA's list of Acceptable Crashworthy Category 2 Hardware for Work Zones which meet NCHRP Report 350 criteria for crashworthiness. Category 2 devices that have not received FHWA acceptance and were purchased before October 1, 2000, shall not be used. Category 2 devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer by the start of the project. The label shall be readable and permanently affixed by the manufacturer. Category 2 devices without a label shall not be used in highway work zones.

Category 3 devices shall be crash tested in accordance with NCHRP Report 350 criteria. The Department shall include Standard Special Provision (SSP) 12-000, Standard Plans and construction details in all contract documents.

Support:

For Category 3, the compliance date was October 1, 1998 for truck mounted attenuators and work zone crash cushions. The compliance date for other Category 3 devices was October 1, 2002.

Option:

Type III barricades may be used as sign supports if the barricades have been successfully crash tested as one unit with a construction area sign attached.

Support:

Category 1 self-certification form can be obtained at the following Internet address (see last page):
http://www.dot.ca.gov/hq/traffops/signtech/signdel/policy/05-09.pdf

Category 2 devices are listed on the "Acceptable Crashworthy Category 2 Hardware for Work Zones" list maintained by both, FHWA and Department of Transportation, available at the following internet addresses:
http://safety.fhwa.dot.gov/fourthlevel/hardware/listing.cfm?code=workzone
http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf/Category2.pdf .

Category 3 TTC devices are shown in the Standard Plans, on project plans or listed on the Department's Highway Safety Features list at the following Internet address:
http://www.dot.ca.gov/hq/esc/approved_products_list/HighwaySafe.htm .

Section 6F.02 General Characteristics of Signs

Support:

TTC zone signs convey both general and specific messages by means of words or symbols and have the same three categories as all road user signs: regulatory, warning, and guide.

Standard:

The colors for regulatory signs shall follow the Standards for regulatory signs in Table ~~2A-4~~ 2A-4(CA) and Chapter 2B. Warning signs in TTC zones shall have a black legend and border on an orange background, except for the Highway-Rail Grade Crossing Advance Warning (W10-1) sign which shall have a black legend and border on a yellow background, and except for signs that are permitted in Parts 2 or 7 to have fluorescent yellow-green backgrounds. Colors for guide signs shall follow the Standards in Table ~~2A-4~~ 2A-4(CA) and Chapter 2D, except for guide signs as noted in Section 6F.50.

Option:

Where the color orange is required, fluorescent red-orange or fluorescent yellow-orange colors may also be used.

Support:

The fluorescent versions of orange provide higher conspicuity than standard orange, especially during twilight.

Option:

Warning and guide signs used for ~~TCC~~ TTC incident management situations (see Chapter 6I) may have a black legend and border on a fluorescent pink background.

Existing warning signs that are still applicable may remain in place.

In order to maintain the systematic use of yellow or fluorescent yellow-green background for pedestrian, bicycle, and school warning signs in a jurisdiction, the yellow or fluorescent yellow-green background for pedestrian, bicycle, and school warning signs may be used in TTC zones.

Standard orange flags or flashing warning lights may be used in conjunction with signs.

Standard:

When standard orange flags or flashing warning lights are used in conjunction with signs, they shall not block the sign face.

The sizes for TTC signs shall be as shown in Table 6F-1 or 6F-1(CA).

Option:

The dimensions of signs shown in Table 6F-1 or 6F-1(CA) may be increased wherever necessary for greater legibility or emphasis, such as on freeways and expressways.

Standard:

Deviations from standard sizes as prescribed herein shall be in 150 mm (6 in) increments.

Support:

Sign design details are contained in the "Standard Highway Signs" book (see Section 1A.11).

Standard:

All signs used at night shall be either retroreflective with a material that has a smooth, sealed outer surface or illuminated to show the same shape and similar color both day and night.

The requirement for sign illumination shall not be considered to be satisfied by street, highway, or strobe lighting.

Option:

Sign illumination may be either internal or external.

Signs may be made of rigid or flexible material.

Support:

Sign design details are contained in FHWA's Standard Highway Signs book and Department of Transportation's California Sign Specifications. See Section 1A.11 for information regarding these publications.

Table 6F-101(CA) shows a list of California TTC Signs.

Figure 6F-101(CA) shows California TTC Signs.

Section 6F.03 Sign Placement

Guidance:

Signs should be located on the right side of the roadway unless otherwise specified in this Manual.

Option:

Where special emphasis is needed, signs may be placed on both the left and right sides of the roadway. Signs mounted on portable supports may be placed within the roadway itself. Signs may also be mounted on or above barricades.

Support:

The Provisions of this section regarding mounting height apply unless specifically stated otherwise for a particular sign elsewhere in this Manual.

Guidelines for height and lateral clearance of temporary ground-mounted signs are shown in Figure 6F-1.

Standard:

Ground-mounted signs installed at the side of the road in rural areas shall be mounted at a height at least 1.5 m (5 ft), measured from the bottom of the sign to the near edge of the pavement. In business, commercial, and residential districts where parking and/or bicycle or pedestrian movement is likely to occur, or where there are other obstructions to view, the distance between the bottom of the sign and the top of the near edge of the traveled way shall be at least 2.1 m (7 ft).

Signs mounted on barricades and barricade/sign combinations shall be crashworthy.

Where it has been determined that the accommodation of pedestrians with disabilities is necessary, signs shall be mounted and placed in accordance with Section 4.4 of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11).

Guidance:

~~Neither portable nor permanent sign supports should be located on sidewalks, bicycle facilities, or areas designated for pedestrian or bicycle traffic.~~ Sign supports should be located so as to accommodate pedestrians and bicyclists in areas designated for their use. A minimum lateral width of 1.2 m (4 ft) should be maintained for pedestrian pathways. Signs mounted lower than 2.1 m (7 ft) should not project more than 100 mm (4 in) into pedestrian facilities.

Option:

A 2.1 m (7 ft) mounting height may be used in rural areas for increased visibility.

The height to the bottom of a secondary sign mounted below another sign may be 0.3 m (1 ft) less than the appropriate height specified above.

Guidance:

Except as noted in the Option, signs mounted on portable supports should not be used for a duration of more than 3 days.

Option:

The R9-8 through R9-11a series, R11 series, W1-6 through W1-8 series, M4-10, E5-1, or other similar type signs (see Figures 6F-3, 6F-4, and 6F-5) may be used on portable supports for longer than 3 days.

Support:

Methods of mounting signs other than on posts are illustrated in Figure 6F-2.

Guidance:

Signs mounted on Type III barricades should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.

Standard:

Sign supports shall be crashworthy. Large signs having an area exceeding 5 square meters (50 square feet) that are installed on multiple breakaway posts shall be mounted a minimum of 2.1 m (7 ft) above the ground.

Signs mounted on barricades, or other portable supports, shall be no less than 0.3 m (1 ft) above the traveled way.

Option:

For mobile operations, a sign may be mounted on a work vehicle, a shadow vehicle, or a trailer stationed in advance of the TTC zone or moving along with it. The work vehicle, the shadow vehicle, or the trailer may or may not have an impact attenuator.

Guidance:

Unshielded sign posts placed in the clear zone should yield or breakaway upon impact to minimize obstructions to road users.

Support:

If alterations are made to specific traffic control device supports that have been successfully crash tested in accordance with NCHRP Report 350 (see Section 1A.11), the altered supports might not be considered to be crashworthy.

Section 6F.04 Sign Maintenance

Standard:

Signs shall be properly maintained for cleanliness, visibility, and correct positioning.

Signs that have lost significant legibility shall be promptly replaced.

Section 6F.05 Regulatory Sign Authority

Support:

Regulatory signs such as those shown in Figure 6F-3 inform road users of traffic laws or regulations and indicate the applicability of legal requirements that would not otherwise be apparent.

Standard:

Regulatory signs shall be authorized by the public agency or official having jurisdiction and shall conform with Chapter 2B.

Support:

Some of the California regulatory signs used in TTC zones are shown in Figure 6F-101(CA) and Table 6F-101(CA).

Section 6F.06 Regulatory Sign Design

Standard:

TTC regulatory signs shall conform to the Standards for regulatory signs presented in Part 2 and in the FHWA's "Standard Highway Signs" book (see Section 1A.11).

Support:

Regulatory signs are generally rectangular with a black legend and border on a white background. Exceptions include the STOP, YIELD, DO NOT ENTER, WRONG WAY, and ONE WAY signs.

Option:

The ONE WAY sign may be either a horizontal or vertical rectangular sign.

Section 6F.07 Regulatory Sign Applications

Standard:

If a TTC zone requires regulatory measures different from those existing, the existing permanent regulatory devices shall be removed or covered and superseded by the appropriate temporary regulatory signs. This change shall be made in conformance with applicable ordinances or statutes of the jurisdiction.

Section 6F.08 ROAD (STREET) CLOSED Sign (R11-2)

Guidance:

The ROAD (STREET) CLOSED (R11-2) sign (see Figure 6F-3, Sheet 2 of 2) should be used when the roadway is closed to all road users except contractors' equipment or officially authorized vehicles. The R11-2 sign should be accompanied by appropriate warning and detour signing.

Option:

The ~~words BRIDGE OUT (or BRIDGE CLOSED)~~ word BRIDGE CLOSED may be substituted for ROAD (STREET) CLOSED where applicable.

Guidance:

The ROAD (STREET) CLOSED sign should be installed at or near the center of the roadway on or above a Type III barricade that closes the roadway (see Section 6F.63).

Standard:

The ROAD (STREET) CLOSED sign shall not be used where road user flow is maintained or where the actual closure is some distance beyond the sign.

Option:

The word RAMP may be substituted for ROAD or STREET where applicable.

Section 6F.09 Local Traffic Only Signs (R11-3a, R11-4)

Guidance:

The Local Traffic Only signs (see Figure 6F-3, Sheet 2 of 2) should be used where road user flow detours to avoid a closure some distance beyond the sign, but where local road users can use the roadway to the point of closure. These signs should be accompanied by appropriate warning and detour signing.

In rural applications, the Local Traffic Only sign should have the legend ROAD CLOSED XX ~~km~~ (MILES)AHEAD, LOCAL TRAFFIC ONLY (R11-3a).

Option:

In urban areas, the legend ROAD (STREET) CLOSED TO THRU TRAFFIC (R11-4) or ROAD CLOSED, LOCAL TRAFFIC ONLY may be used.

The words BRIDGE OUT (or BRIDGE CLOSED) may be substituted for the words ROAD (STREET) CLOSED on the R11-3a or R11-4 sign where applicable.

Option:

The word RAMP may be substituted for ROAD or STREET where applicable.

Section 6F.10 Weight Limit Signs (R12-1, R12-2, R12-5)

Standard:

A Weight Limit sign (see Figure 6F-3, Sheet 2 of 2), which shows the gross weight ~~or axle weight~~ that is permitted on the roadway or bridge, shall be consistent with State or local regulations and shall not be installed without the approval of the authority having jurisdiction over the highway.

When weight restrictions are imposed because of the activity in a TTC zone, a marked detour shall be provided for vehicles weighing more than the posted limit.

Section 6F.11 STAY IN LANE Sign (R4-9)

Option:

A STAY IN LANE (R4-9) sign (see Figure 6F-3, Sheet 1 of 2) may be used where a multi-lane shift has been incorporated as part of the TTC on a highway to direct road users around road work that occupies part of the roadway on a multi-lane highway.

Section 6F.12 PEDESTRIAN CROSSWALK Sign (R9-8)

Option:

The PEDESTRIAN CROSSWALK (R9-8) sign (see Figure 6F-3, Sheet 1 of 2) may be used to indicate where a temporary crosswalk has been established.

Standard:

If a temporary crosswalk is established, it shall be accessible to pedestrians with disabilities in accordance with Section 6D.02.

Section 6F.13 SIDEWALK CLOSED Signs (R9-9, R9-10, R9-11, R9-11a)

Guidance:

SIDEWALK CLOSED signs (see Figure 6F-3, Sheet 2 of 2) should be used where pedestrian flow is restricted. Bicycle/Pedestrian Detour (M4-9a) signs or Pedestrian Detour (M4-9b) signs should be used where pedestrian flow is rerouted (see Section 6F.53).

The SIDEWALK CLOSED (R9-9) sign should be installed at the beginning of the closed sidewalk, at the intersections preceding the closed sidewalk, and elsewhere along the closed sidewalk as needed.

The SIDEWALK CLOSED, (ARROW) USE OTHER SIDE (R9-10) sign should be installed at the beginning of the restricted sidewalk when a parallel sidewalk exists on the other side of the roadway.

The SIDEWALK CLOSED AHEAD, (ARROW) CROSS HERE (R9-11) sign should be used to indicate to pedestrians that sidewalks beyond the sign are closed and to direct them to open crosswalks, sidewalks, or other travel paths.

The SIDEWALK CLOSED, (ARROW) CROSS HERE (R9-11a) sign should be installed just beyond the point to which pedestrians are being redirected.

Support:

These signs are typically mounted on a detectable barricade to encourage compliance and to communicate with pedestrians that the sidewalk is closed. Printed signs are not useful to many pedestrians with visual disabilities. A barrier or barricade detectable by a person with a visual disability is sufficient to indicate that a sidewalk is closed. If the barrier is continuous with detectable channelizing devices for an alternate route, accessible signage might not be necessary. An audible information device is needed when the detectable barricade or barrier for an alternate channelized route is not continuous.

Section 6F.14 Special Regulatory Signs

Option:

Special regulatory signs may be used based on engineering judgment consistent with regulatory requirements.

Guidance:

Special regulatory signs should conform to the general requirements of color, shape, and alphabet size and series. The sign message should be brief, legible, and clear.

Support:

Section 2B.17 contains information regarding the use of FINES HIGHER signs (see Figure 6F-3, Sheet 1 of 2).

See Section 6F.106(CA) for Traffic Fines Signs.

Section 6F.15 Warning Sign Function, Design, and Application

Support:

TTC zone warning signs (see Figure 6F-4) notify road users of specific situations or conditions on or adjacent to a roadway that might not otherwise be apparent.

Standard:

TTC warning signs shall conform to the Standards for warning signs presented in Part 2 and in FHWA's "Standard Highway Signs" book (see Section 1A.11). Except as noted in the Option below, TTC warning signs shall be diamond-shaped with a black legend and border on an orange background, except for the W10-1 sign which shall have a black legend and border on a yellow background, and except for signs that are permitted in Parts 2 or 7 to have fluorescent yellow-green backgrounds.

Option:

Warning signs used for TCC incident management situations may have a black legend and border on a fluorescent pink background.

Mounting or space considerations may justify a change from the standard diamond shape.

In emergencies, available warning signs having yellow backgrounds may be used if signs with orange or fluorescent pink backgrounds are not at hand.

Guidance:

Where roadway or road user conditions require greater emphasis, larger than standard size warning signs should be used, with the symbol or legend enlarged approximately in proportion to the outside dimensions.

Where any part of the roadway is obstructed or closed by work activities or incidents, advance warning signs should be installed to alert road users well in advance of these obstructions or restrictions.

Where road users include pedestrians, the provision of supplemental audible information or detectable barriers or barricades should be considered for people with visual disabilities.

Support:

Detectable barriers or barricades communicate very clearly to pedestrians who have visual disabilities that they can no longer proceed in the direction that they are traveling.

Option:

Advance warning signs may be used singly or in combination.

~~**Standard:**~~

~~**Because of their importance, advance warning signs for higher-speed locations shall have a size of 1200 x 1200 mm (48 x 48 in) (see Part 2).**~~

~~**For freeways and expressways, the size of diamond shaped TTC warning signs shall be a minimum of 1200 x 1200 mm (48 x 48 in).**~~

~~Option:~~

~~Where speeds and volumes are moderately low, a minimum size of 900 x 900 mm (36 x 36 in) may be used for advance warning signs.~~

~~On secondary roads or City streets where speeds are very low, signs smaller than the standard size, but not less than 600 x 600 mm (24 x 24 in), may be used for warning signs having short word messages or clear symbols.~~

Standard:

The previous paragraphs are deleted for application and shall not be used in California as "higher-speed", "moderately low" and "very low" are not defined in the MUTCD. Use Table 2C-2 in Part 2 for size of warning signs.

Option:

Advance warning signs larger than the minimum standards may be used for additional emphasis of the TTC zone (see Part 2).

Where distances are not shown on warning signs as part of the message, a supplemental plaque with the distance legend may be mounted immediately below the sign on the same support.

Support:

Some of the California warning signs used in TTC zones are shown in Figure 6F-101(CA) and Table 6F-101(CA).

Section 6F.16 Position of Advance Warning Signs

Guidance:

Where highway conditions permit, warning signs should be placed in advance of the TTC zone at varying distances depending on roadway type, condition, and posted speed. Table 6C-1 contains information

regarding the spacing of advance warning signs. Where a series of two or more advance warning signs is used, the closest sign to the TTC zone should be placed approximately 30 m (100 ft) for low-speed urban streets to 300 m (1,000 ft) or more for freeways and expressways.

Support:

Various conditions, such as limited sight distance or obstructions that might require a driver to reduce speed or stop, might require additional advance warning signs.

Option:

As an alternative to a specific distance on advance warning signs, the word AHEAD may be used.

Support:

At TTC zones on lightly-traveled roads, all of the advance warning signs prescribed for major construction might not be needed.

Option:

Utility work, maintenance, or minor construction can occur within the TTC zone limits of a major construction project, and additional warning signs may be needed.

Guidance:

Utility, maintenance, and minor construction signing and TTC should be coordinated with appropriate authorities so that road users are not confused or misled by the additional TTC devices.

Section 6F.17 ROAD (STREET) WORK Sign (W20-1)

Guidance:

The ROAD (STREET) WORK (W20-1) sign (see Figure 6F-4, Sheet 3 of 4), which serves as a general warning of obstructions or restrictions, should be located in advance of the work space or any detour, on the road where the work is taking place.

Where traffic can enter a TTC zone from a crossroad or a major (high-volume) driveway, an advance warning sign should be used on the crossroad or major driveway.

Standard:

The ROAD (STREET) WORK (W20-1) sign shall have the legend ROAD (STREET) WORK, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD.

Option:

The word RAMP may be substituted for ROAD or STREET where applicable.

The ROAD (STREET) WORK Informational Plaque (C23B(CA)) may be used with ROAD (STREET) WORK (W20-1) sign.

Standard:

The message displayed on the ROAD (STREET) WORK Informational Plaque (C23B(CA)) shall be worded in terms common to motorists, as shown in examples below. The height and width of the plate will vary according to the lettering size and message. The width of the plate shall not exceed the overall width of the W20-1 sign.

Support:

Following are some example messages:

- BRIDGE REPLACEMENT
- BRIDGE WIDENING
- BRIDGE REPAIR
- CURVE IMPROVEMENT
- HIGHWAY REALIGNMENT
- HIGHWAY WIDENING
- HIGHWAY WIDENING AND PAVING
- HIGHWAY REHABILITATION
- STORM REPAIR
- PAVING
- SIGNING IMPROVEMENT
- PAVEMENT MAINTENANCE
- SAFETY IMPROVEMENT

Guidance:

The SPECIAL EVENT AHEAD (SC5(CA)) sign should be used in lieu of the ROAD (STREET) WORK (W20-1) sign for special events, such as bike races, movie filming, etc., where the event is on the travel way or close enough or of such a nature as to cause a potential danger to motorists.

Section 6F.18 DETOUR Sign (W20-2)

Guidance:

The DETOUR (W20-2) sign (see Figure 6F-4, Sheet 3 of 4) ~~should~~ **shall** be used in advance of a road user detour over a different roadway or route. Refer to CVC 21363 for detour signs.

Standard:

The DETOUR sign shall have the legend DETOUR, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD.

Section 6F.19 ROAD (STREET) CLOSED Sign (W20-3)

Guidance:

The ROAD (STREET) CLOSED (W20-3) sign (see Figure 6F-4, Sheet 3 of 4) should be used in advance of the point where a highway is closed to all road users, or to all but local road users.

Standard:

The ROAD (STREET) CLOSED sign shall have the legend ROAD (STREET) CLOSED, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD.

Option:

The word RAMP may be substituted for ROAD or STREET, where applicable.

Section 6F.20 ONE LANE ROAD Sign (W20-4)

Standard:

The ONE LANE ROAD (W20-4) sign (see Figure 6F-4, Sheet 3 of 4) shall be used only in advance of that point where motor vehicle traffic in both directions must use a common single lane (see Section 6C.10). It shall have the legend ONE LANE ROAD, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD.

Section 6F.21 Lane(s) Closed Signs (W20-5, W20-5a)

Standard:

The Lane(s) Closed sign (see Figure 6F-4, Sheet 3 of 4) shall be used in advance of that point where one or more through lanes of a multi-lane roadway are closed.

For a single lane closure, the Lane Closed (W20-5) sign (see Figure 6F-4, Sheet 3 of 4) shall have the legend RIGHT (LEFT) LANE CLOSED, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD. Where two adjacent lanes are closed, the W20-5a sign (see Figure 6F-4, Sheet 3 of 4) shall have the legend RIGHT (LEFT) TWO LANES CLOSED, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD.

Option:

The Lane Closed (W20-5 or C20(CA)) sign by itself, or in combination with LEFT (C20A(CA)) plaque and/or Numeral (C20B(CA)) plaque may be used.

The LANE CLOSED (C30(CA)) sign may be used within a closed lane of a multilane highway as follow-up information to the appropriate advance warning signs. The C30(CA) sign may be repeated at intervals, throughout long lane closures, as a reminder to motorists.

The words RAMP CLOSED may be used as an alternate message on the C30(CA) signs on surface streets to warn that the upcoming freeway/expressway on ramp is closed.

Section 6F.22 CENTER LANE CLOSED AHEAD Signs (W9-3, W9-3a)

Guidance:

The CENTER LANE CLOSED AHEAD (W9-3) sign (see Figure 6F-4, Sheet 2 of 4) should be used in advance of that point where work occupies the center lane(s) and approaching motor vehicle traffic is directed to the right or left of the work zone in the center lane.

Option:

The Center Lane Closed Ahead (W9-3a) symbol sign ~~(see Figure 6H-38)~~ may be substituted for the CENTER LANE CLOSED AHEAD (W9-3) word message sign.

Support:

For moving lane closures on State highways, see Department of Transportation's Standard Plan T-16. See Section 1A.11 for information regarding this publication.

Do not use the CENTER LANE CLOSED AHEAD (W9-3) and Center Lane Closed Ahead (W9-3a) signs for moving lane closures on State highways.

Section 6F.23 THRU TRAFFIC MERGE LEFT (RIGHT) Sign (W4-7)

Guidance:

The THRU TRAFFIC MERGE LEFT (RIGHT) (W4-7) sign (see Figure 6F-4, Sheet 1 of 4) should be used in advance of an intersection where one or more lane closures on the far side of a multi-lane intersection require through vehicular traffic on the approach to the intersection to use the left (right) lane to proceed through the intersection.

Support:

Refer to Section 2C.33 for Lane Ends (W4-2, W9-1) signs and 2C.109 for Lane Drop (W73(CA), W73A(CA) and W4-7) signs.

Section 6F.24 Lane Ends Sign (W4-2)

Option:

The Lane Ends (W4-2) symbol sign (see Figure 6F-4, Sheet 1 of 4) ~~may~~ should be used to warn drivers of the reduction in the number of lanes for moving motor vehicle traffic in the direction of travel on a multi-lane roadway.

Section 6F.25 ON RAMP Plaque (W13-4)

~~Guidance:~~

~~When work is being done on a ramp, but the ramp remains open, the ON RAMP (W13-4) plaque (see Figure 6F-4, Sheet 3 of 4) should be used to supplement the advance ROAD WORK sign.~~

Standard:

The ON RAMP (W13-4) plaque shall not be used in California due to the potential for conflict if it is used when the work is being done on an off ramp.

Section 6F.26 RAMP NARROWS Sign (W5-4)

~~Guidance:~~

~~The RAMP NARROWS (W5-4) sign (see Figure 6F-4, Sheet 1 of 4) should be used in advance of the point where work on a ramp reduces the normal width of the ramp along a part or all of the ramp.~~

Standard:

The RAMP NARROWS (W5-4) sign shall not be used in California. The ROAD NARROWS (W5-1) sign or NARROW LANE(S) (C12(CA)) sign, as appropriate, shall be used instead. See Sections 2C.15 and 6F.103(CA).

Section 6F.27 SLOW TRAFFIC AHEAD Sign (W23-1)

Option:

The SLOW TRAFFIC AHEAD (W23-1) sign (see Figure 6F-4, Sheet 4 of 4) may be used on a shadow vehicle, usually mounted on the rear of the most upstream shadow vehicle, along with other appropriate signs for mobile operations to warn of slow moving work vehicles. A ROAD (STREET) WORK (W20-1) sign may also be used with the SLOW TRAFFIC AHEAD sign.

Section 6F.28 EXIT OPEN, EXIT CLOSED, EXIT ONLY Signs (E5-2, E5-2a, E5-3)

Option:

An EXIT OPEN (E5-2), EXIT CLOSED (E5-2a), or EXIT ONLY (E5-3) sign (see Figure 6F-5) may be used to supplement other warning signs where work is being conducted in the vicinity of an exit ramp and where the exit maneuver for motor vehicle traffic using the ramp is different from the normal condition.

Guidance:

When an exit ramp is closed, an EXIT CLOSED panel with a black legend and border on an orange background should be placed diagonally across the interchange/intersection guide signs.

Option:

The USE NEXT EXIT (C38(CA)) sign may be used with the RAMP CLOSED (R11-2, alternate message per Section 6F.08) sign on freeways if the next exit provides access to destinations from the closed ramp.

Guidance:

The RAMP CLOSED (Not more than one day) (SC6-3(CA)) sign should be used to inform motorists of the temporary closing of a freeway or expressway entrance or exit ramp for not more than one day.

The RAMP CLOSED (More than one day) (SC6-4(CA)) sign should be used to inform motorists of the temporary closing of a freeway or expressway entrance or exit ramp for more than one day.

The SC6-3(CA) and SC6-4(CA) signs should be removed when the ramp is reopened to traffic.

Standard:

The SC6-3(CA) and SC6-4(CA) signs shall display the correct day of the week, month, calendar day and times the ramp is closed.

Support:

The Day/Month (SC6A(CA)) plaque is used on the RAMP CLOSED (SC6-3(CA) and SC6-4(CA)) signs, to provide the appropriate day of the week and month a freeway or expressway entrance or exit ramp is closed.

The Time (SC6B(CA)) plaque is used on the RAMP CLOSED (SC6-3(CA) and SC6-4(CA)) signs, to provide the appropriate time of the day a freeway or expressway entrance or exit ramp is closed.

Option:

The RAMP CLOSED, USE RAMP AT ___ (SC7(CA)) sign may be used in lieu of the RAMP CLOSED (R11-2 sign, alternate message per Section 6F.08) sign and USE NEXT EXIT (C38(CA)) signs as shown on Department of Transportation's Standard Plan T-14 to inform motorists of a closed entrance or exit ramp and to provide an alternate route. See Section 1A.11 for information regarding these publication.

Guidance:

The ___ EXIT – RAMP CLOSED (SC8(CA)) sign should be used to inform motorists of a closed exit ramp.

Standard:

The SC8(CA) sign shall be placed on the right shoulder, upstream of the preceding exit ramp.

Section 6F.29 Flagger Sign (W20-7a, W20-7)

Guidance:

The ~~Flagger (20-7a) symbol sign (see Figure 6F-4, Sheet 3 of 4)~~ California Flagger symbol (C9A(CA)) sign should be used in advance of any point where a flagger is stationed to control road users.

Option:

A distance legend may be displayed on a supplemental plaque below the Flagger sign. The sign may be used with appropriate legends or in conjunction with other warning signs, such as the BE PREPARED TO STOP (W3-4) sign (see Figure 6F-4, Sheet 1 of 4).

The FLAGGER (W20-7) word message sign with distance legends may be substituted for the ~~Flagger (W20-7a) symbol sign~~ California Flagger symbol (C9A(CA)) sign.

Standard:

The Flagger sign shall be removed, covered, or turned away from road users when the flagging operations are not occurring.

The MUTCD Flagger symbol (W20-7a) sign shall not be used, the California Flagger symbol (C9A(CA)) sign shall be used, instead.

Section 6F.30 Two-Way Traffic Sign (W6-3)

Guidance:

When one roadway of a normally divided highway is closed, with two-way vehicular traffic maintained on the other roadway, the Two-Way Traffic (W6-3) sign (see Figure 6F-4, Sheet 2 of 4) should be used at the beginning of the two-way vehicular traffic section and at intervals to remind road users of opposing vehicular traffic.

Guidance:

The Two-Way Traffic (W6-3) sign should also be used at locations where motorists could perceive that they are on a one-way roadway when, in fact, they are on a two lane, two-way highway.

Support:

Following are some typical situations:

- Construction sites where a two-lane highway is being converted to a freeway or an expressway.
- Two-lane, two-way highways where ultimate freeway or expressway right-of-way has been purchased and grading for the full width has been completed.
- Two-lane, two-way highways following long sections of multi-lane freeway or expressway.

Section 6F.31 Workers Sign (W21-1, W21-1a)

Option:

A Workers (W21-1a) symbol sign (see Figure 6F-4, Sheet 3 of 4) may be used to alert road users of workers in or near the roadway.

Guidance:

In the absence of other warning devices, a Workers symbol sign should be used when workers are in the roadway.

Option:

The WORKERS (W21-1) word message sign may be used as an alternate to the Workers (W21-1a) symbol sign.

Section 6F.32 FRESH OIL (TAR) Sign (W21-2)

Guidance:

The FRESH OIL (TAR) (W21-2) sign (see Figure 6F-4, Sheet 3 of 4) should be used to warn road users of the surface treatment.

Section 6F.33 ROAD MACHINERY AHEAD Sign (W21-3)

Option:

The ROAD MACHINERY AHEAD (W21-3) sign (see Figure 6F-4, Sheet 3 of 4) may be used to warn of machinery operating in or adjacent to the roadway.

Section 6F.34 Motorized Traffic Signs (W8-6, W11-10)

Option:

Motorized Traffic (W8-6, W11-10) signs may be used to alert road users to locations where unexpected travel on the roadway or entries into or departures from the roadway by construction vehicles might occur. The TRUCK CROSSING (W8-6) word message sign may be used as an alternate to the Truck Crossing symbol (W11-10) sign (see Figure 6F-4, Sheet 2 of 4) where there is an established construction vehicle crossing of the roadway.

Support:

These locations might be relatively confined or might occur randomly over a segment of roadway.

Section 6F.35 Shoulder Work Signs (W21-5, W21-5a,)

Support:

Shoulder Work signs (see Figure 6F-4, Sheets 3 and 4 of 4) warn of maintenance, reconstruction, or utility operations on the highway shoulder where the roadway is unobstructed.

Standard:

The Shoulder Work sign shall have the legend SHOULDER WORK (W21-5), RIGHT (LEFT) SHOULDER CLOSED (W21-5a), or RIGHT (LEFT) SHOULDER CLOSED XXX ~~m~~ (FT) or AHEAD (W21-5b) or SHOULDER WORK AHEAD (C24(CA)).

Option:

The Shoulder Work sign may be used in advance of the point on a nonlimited access highway where there is shoulder work. It may be used singly or in combination with a ROAD WORK NEXT X ~~km~~ (MILES) or ROAD WORK AHEAD sign.

Guidance:

On freeways and expressways, the RIGHT (LEFT) SHOULDER CLOSED XXX ~~m~~ (FT) or AHEAD (W21-5b) sign followed by RIGHT (LEFT) SHOULDER CLOSED (W21-5a) sign should be used in advance of the point where the shoulder work occurs and should be preceded by a ROAD WORK AHEAD sign.

Option:

The SHOULDER WORK AHEAD (C24(CA)) sign may be used in advance of the point where maintenance, reconstruction, or utility operations involve the shoulder but the roadway is unobstructed.

The SHOULDER CLOSED (C30A(CA)) sign may be used within a shoulder area that has been closed due to work near the traveled way. The C30A(CA) sign is supplemental to appropriate advance warning signs.

Section 6F.36 SURVEY CREW Sign (W21-6)

Guidance:

The SURVEY CREW (W21-6) sign (see Figure 6F-4, Sheet 4 of 4) should be used to warn of surveying crews working in or adjacent to the roadway.

Section 6F.37 UTILITY WORK Sign (W21-7)

Option:

The UTILITY WORK (W21-7) sign (see Figure 6F-4, Sheet 4 of 4) may be used as an alternate to the ROAD (STREET) WORK (W20-1) sign for utility operations on or adjacent to a highway.

Support:

Typical examples of where the UTILITY WORK sign is used appear in Figures ~~6H-4~~ 6H-4(CA), 6H-6, ~~6H-10~~ 6H-10(CA), 6H-15, 6H-18, 6H-21, 6H-22, 6H-26, and 6H-33.

Standard:

The UTILITY WORK sign shall carry the legend UTILITY WORK, XX ~~m~~ (FT), XX ~~km~~ (MILES), or AHEAD.

Section 6F.38 Signs for Blasting Areas

Support:

Radio-Frequency (RF) energy can cause the premature firing of electric detonators (blasting caps) used in TTC zones.

Standard:

Road users shall be warned to turn off mobile radio transmitters and cellular telephones where blasting operations occur. A sequence of signs shall be prominently displayed to direct operators of mobile radio equipment, including cellular telephones, to turn off transmitters in a blasting area. These signs shall be covered or removed when there are no explosives in the area or the area is otherwise secured.

Section 6F.39 BLASTING ZONE AHEAD Sign (W22-1)

Standard:

The BLASTING ZONE AHEAD (W22-1) sign (see Figure 6F-4, Sheet 4 of 4) shall be used in advance of any TTC zone where explosives are being used. The TURN OFF 2-WAY RADIO AND CELL PHONE and END BLASTING ZONE signs shall be used in sequence with this sign.

Section 6F.40 TURN OFF 2-WAY RADIO AND CELL PHONE Sign (W22-2)

Standard:

The TURN OFF 2-WAY RADIO AND CELL PHONE (W22-2) sign (see Figure 6F-4, Sheet 4 of 4) shall follow the BLASTING ZONE AHEAD sign and shall be placed at least 300 m (1,000 ft) before the beginning of the blasting zone.

Section 6F.41 END BLASTING ZONE Sign (W22-3)

Standard:

The END BLASTING ZONE (W22-3) sign (see Figure 6F-4, Sheet 4 of 4) shall be placed a minimum of 300 m (1,000 ft) past the blasting zone.

Option:

The END BLASTING ZONE sign may be placed either with or preceding the END ROAD WORK sign.

Section 6F.42 Shoulder Signs (W8-4, W8-9, W8-9a)

Option:

The SOFT SHOULDER (W8-4) sign (see Figure 6F-4, Sheet 2 of 4) may be used to warn of a soft shoulder condition.

The LOW SHOULDER (W8-9) sign (see Figure 6F-4, Sheet 2 of 4) may be used to warn of a shoulder condition where there is an elevation difference of less than 75 mm (3 in) between the shoulder and the travel lane.

Guidance:

The SHOULDER DROP OFF (W8-9a) sign (see Figure 6F-4, Sheet 2 of 4) should be used when an unprotected shoulder drop-off, adjacent to the travel lane, exceeds 75 mm (3 in) in depth for a continuous length along the roadway, based on engineering judgment.

Option:

The NO SHOULDER (C31A(CA)) sign may be used where no earth, gravel or paved shoulders are available for vehicles to pull off the roadway.

Section 6F.43 UNEVEN LANES Sign (W8-11)

Guidance:

The UNEVEN LANES (W8-11) sign (see Figure 6F-4, Sheet 2 of 4) should be used during operations that create a difference in elevation between adjacent lanes that are open to travel of 50 mm (2 in) or more.

Section 6F.44 NO CENTER STRIPE Sign (W8-12)

Guidance:

The NO CENTER STRIPE (W8-12) sign (see Figure 6F-4, Sheet 2 of 4) should be used when the work obliterates the centerline pavement markings. This sign should be placed at the beginning of the TTC zone and repeated at 3.2 km (2 mi) intervals in long TTC zones.

Standard:

The NO CENTER STRIPE (W8-12) sign shall not be used on State highways. Whenever construction or maintenance work causes obliteration of center stripe, temporary or permanent center stripe shall be in place prior to opening the State highway to public traffic.

Section 6F.45 Double Reverse Curve Signs (W24 Series)

Option:

The Double Reverse Curve (W24-1, ~~W24-1a, or W24-1b~~) sign (see Figure 6F-4, Sheet 4 of 4) may be used when the tangent distance between two reverse curves is less than 180 m (600 ft), thus making it difficult for a second Reverse Curve (W1-4 ~~Series~~) sign to be placed between the curves.

Standard:

If a Double Reverse Curve sign is used, ~~the number of lanes illustrated on the sign shall be the same as the number of through lanes available to road users~~, and the direction of the double reverse curve shall be appropriately illustrated.

Section 6F.46 Other Warning Signs

Option:

Advance warning signs may be used by themselves or with other advance warning signs.

Besides the warning signs specifically related to TTC zones, several other warning signs in Part 2 may apply in TTC zones.

Standard:

Except as noted in Section 6F.02, other warning signs that are used in TTC zones shall have black legends and borders on an orange background.

Section 6F.47 Special Warning Signs

Option:

Special warning signs may be used based on engineering judgment.

Guidance:

Special warning signs should conform to the general requirements of color, shape, and alphabet size and series. The sign message should be brief, legible, and clear.

Section 6F.48 Advisory Speed Plaque (W13-1)

Option:

In combination with a warning sign, an Advisory Speed (W13-1) plaque (see Figure 6F-4, Sheet 2 of 4) may be used to indicate a recommended safe speed through the TTC zone.

Standard:

The Advisory Speed plaque shall not be used in conjunction with any sign other than a warning sign, nor shall it be used alone. When used with orange TTC zone signs, this plaque shall have a black legend and border on an orange background. The sign shall be at least 600 x 600 mm (24 x 24 in) in size when used with a sign that is 900 x 900 mm (36 x 36 in) or larger. Except in emergencies, an Advisory Speed plaque shall not be mounted until the recommended speed is determined by the highway agency.

Section 6F.49 Supplementary Distance Plaque (W7-3a)

Option:

In combination with a warning sign, a Supplementary Distance (W7-3a) plaque with the legend NEXT XX ~~km~~ (MILES) may be used to indicate the length of highway over which a work activity is being conducted, or over which a condition exists in the TTC zone.

In long TTC zones, Supplementary Distance plaques with the legend NEXT XX ~~km~~ (MILES) may be placed in combination with warning signs at regular intervals within the zone to indicate the remaining length of highway over which the TTC work activity or condition exists.

Standard:

The Supplementary Distance plaque with the legend NEXT XX ~~km~~ (MILES) shall not be used in conjunction with any sign other than a warning sign, nor shall it be used alone. When used with orange TTC zone signs, this plaque shall have a black legend and border on an orange background. The sign shall be at least 750 x 600 mm (30 x 24 in) in size when used with a sign that is 900 x 900 mm (36 x 36 in) or larger.

Guidance:

When used in TTC zones, the Supplementary Distance plaque with the legend NEXT XX ~~km~~ (MILES) should be placed below the initial warning sign designating that, within the approaching zone, a temporary work activity or condition exists.

Option:

The XXX FT (C29(CA)) plaque may be used on the face of a warning sign to indicate the length of highway over which a work activity is being conducted, or over which a condition exists in the TTC zone.

Section 6F.50 Guide Signs

Support:

Guide signs along highways provide road users with information to help them along their way through the TTC zone. The design of guide signs is presented in Part 2.

Guidance:

The following guide signs should be used in TTC zones as needed:

A. Standard route markings, where temporary route changes are necessary;

B. Directional signs and street name signs; and

C. Special guide signs relating to the condition or work being done.

Standard:

If additional temporary guide signs are used in TTC zones, they shall have a black legend and border on an orange background.

Option:

Guide signs used in TTC incident management situations may have a black legend and border on a fluorescent pink background.

When directional signs and street name signs are used in conjunction with detour routing, these signs may have a black legend and border on an orange background.

When permanent directional signs or permanent street name signs are used in conjunction with detour signing, they may have a white legend on a green background.

Section 6F.51 ROAD WORK NEXT XX km (MILES) Sign (G20-1)

Guidance:

The ROAD WORK NEXT XX ~~km~~ (MILES) (G20-1) sign (see Figure 6F-4, Sheet 4 of 4) should be installed in advance of TTC zones that are more than 3.2 km (2 mi) in length.

Option:

The ROAD WORK NEXT XX ~~km~~ (MILES) sign may be mounted on a Type III barricade. The sign may also be used for TTC zones of shorter length.

Standard:

The distance shown on the ROAD WORK NEXT XX ~~km~~ (MILES) sign shall be stated to the nearest whole ~~kilometer~~ (or mile).

Option:

The word STATE HIGHWAY may be substituted for ROAD, where applicable.

The word CONSTRUCTION may be substituted for WORK, where applicable.

Section 6F.52 END ROAD WORK Sign (G20-2)

Guidance:

When used, the END ROAD WORK (G20-2) sign (see Figure 6F-4, Sheet 4 of 4) should be placed near the end of the termination area, as determined by engineering judgment.

Option:

The END ROAD WORK sign may be installed on the back of a warning sign facing the opposite direction of road users or on the back of a Type III barricade.

Option:

The END ROAD WORK (G20-2) sign may not be used if the end of the work zone is obvious to motorists or falls within a larger project's limits.

Conditions may be such that posting of END ROAD WORK (G20-2) signs is not helpful. For example, they should normally not be used if other TTC zones begin within 1.6 km (1 mi) of the end of the workspace in rural areas, or about 0.4 km (0.25 mi) within urban areas. For normal daytime maintenance operations, the G20-2 sign is optional.

Section 6F.53 Detour Signs (M4-8, M4-8a, M4-8b, M4-9, M4-9a, M4-9b, M4-9c, and M4-10)

Standard:

Each detour shall be adequately marked with standard temporary route signs and destination signs.

Option:

Detour signs in TTC incident management situations may have a black legend and border on a fluorescent pink background.

The Detour Arrow (M4-10) sign (see Figure 6F-5) may be used where a detour route has been established.

The DETOUR (M4-8) sign (see Figure 6F-5) may be mounted at the top of a route sign assembly to mark a temporary route that detours from a highway, bypasses a section closed by a TTC zone, and rejoins the highway beyond the TTC zone.

Guidance:

The Detour Arrow (M4-10) sign should normally be mounted just below the ROAD CLOSED (R11-2, R11-3a, or R11-4) sign. The Detour Arrow sign should include a horizontal arrow pointed to the right or left as required.

The DETOUR (M4-9) sign (see Figure 6F-5) should be used for unnumbered highways, for emergency situations, for periods of short durations, or where, over relatively short distances, road users are guided along the detour and back to the desired highway without route signs.

A Street Name sign should be placed above, or the street name should be incorporated into, a DETOUR (M4-9) sign to indicate the name of the street being detoured.

Option:

The END DETOUR (M4-8a) or END (M4-8b) sign (see Figure 6F-5) may be used to indicate that the detour has ended.

Guidance:

When the END DETOUR sign is used on a numbered highway, the sign should be mounted above a sign after the end of the detour.

The Pedestrian/Bicycle Detour (M4-9a) sign (see Figure 6F-5) should be used where a pedestrian/bicycle detour route has been established because of the closing of a pedestrian/bicycle facility to through traffic.

Standard:

If used, the Pedestrian/Bicycle Detour sign shall have an arrow pointing in the appropriate direction.

Option:

The arrow on a Pedestrian/Bicycle Detour sign may be on the sign face or on a supplemental plaque.

The Pedestrian Detour (M4-9b) sign or Bicycle Detour (M4-9c) sign (see Figure 6F-5) may be used where a pedestrian or bicycle detour route (not both) has been established because of the closing of the pedestrian or bicycle facility to through traffic.

Guidance:

The DETOUR (M4-8) sign should be placed on tangent sections at intervals not to exceed 400 m (1300 ft) and at major intersections.

Option:

In urban areas, the M4-8 signs may be placed at every intersection.

Guidance:

The DETOUR with Arrow (SC3(CA)) sign should be used for unnumbered highways, for emergency situations, for periods of short duration, or where, over relatively short distances, road users are guided along the detour and back to the desired highway without route markers.

The FWY DETOUR with Arrow (SC9(CA)) sign should be used to inform motorists of the direction to follow for a freeway detour.

Section 6F.54 PILOT CAR FOLLOW ME Sign (G20-4)

Standard:

The PILOT CAR FOLLOW ME (G20-4) sign (see Figure 6F-4, Sheet 4 of 4) shall be mounted in a conspicuous position on the rear of a vehicle used for guiding one-way vehicular traffic through or around a TTC zone. A flagger shall be stationed on the approach to the activity area to stop vehicular traffic until the pilot vehicle is available.

Guidance:

The TRAFFIC CONTROL – WAIT AND FOLLOW PILOT CAR (C37(CA)) sign should be used at intersecting approaches to a work zone when pilot cars are controlling reversible lane traffic.

Section 6F.55 Portable Changeable Message Signs

Standard:

Portable Changeable Message signs shall be TTC devices with the flexibility to display a variety of messages. Each message shall consist of either one or two phases. A phase shall consist of up to three lines of eight characters per line. Each character module shall use at least a five wide and seven high pixel matrix.

Support:

Portable Changeable Message signs are used most frequently on high-density urban freeways, but have applications on all types of highways where highway alignment, road user routing problems, or other pertinent conditions require advance warning and information.

Portable Changeable Message signs have a wide variety of applications in TTC zones including: roadway, lane, or ramp closures, crash or emergency incident management, width restriction information, speed control or reductions, advisories on work scheduling, road user management and diversion, warning of adverse conditions or special events, and other operational control.

The primary purpose of Portable Changeable Message signs in TTC zones is to advise the road user of unexpected situations. Some typical applications include the following:

A. Where the speed of vehicular traffic is expected to drop substantially;
B. Where significant queuing and delays are expected;
C. Where adverse environmental conditions are present;
D. Where there are changes in alignment or surface conditions;
E. Where advance notice of ramp, lane, or roadway closures is needed;
F. Where crash or incident management is needed; and/or
G. Where changes in the road user pattern occur.

Guidance:

The components of a Portable Changeable Message sign should include: a message sign panel, control systems, a power source, and mounting and transporting equipment.

Portable Changeable Message signs should subscribe to the principles established in Section 2A.07 and other sections of this Manual and, to the extent practical, with the design (that is, color, letter size and shape, and borders) and applications prescribed in this Manual, except that the reverse colors for the letters and the background are considered acceptable.

The front face of the sign should be covered with a protective material. The color of the elements should be yellow or orange on a black background.

Portable Changeable Message signs should be visible from 800 m (0.5 mi) under both day and night conditions. For a trailer or large truck mounted sign, the letter height should be a minimum of 450 mm (18 in). For Changeable Message signs mounted on service patrol trucks, the letter height should be a minimum of 250 mm (10 in).

The message panel should have adjustable display rates (minimum of 3 seconds per phase), so that the entire message can be read at least twice at the posted speed, the off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed.

Messages should be designed taking into account the following factors:

A. Each phase should convey a single thought.
B. If the message can be displayed in one phase, the top line should present the problem, the center line should present the location or distance ahead, and the bottom line should present the recommended driver action.
C. The message should be as brief as possible.
D. When a message is longer than two phases, additional Portable Changeable Message signs should be used.
E. When abbreviations are used, they should be easily understood (see Section 1A.14).

Option:

The message sign panel may vary in size.

Smaller letter sizes may be used on a Portable Changeable Message sign mounted on a trailer or large truck provided that the message is legible from at least 200 m (650 ft), or mounted on a service patrol truck provided that the message is legible from at least 100 m (330 ft).

Two Portable Changeable Message signs may be used for the purpose of allowing the entire message to be read twice at the posted speed.

Standard:

Portable Changeable Message signs shall automatically adjust their brightness under varying light conditions, to maintain legibility.

The control system shall include a display screen upon which messages can be reviewed before being displayed on the message sign. The control system shall be capable of maintaining memory when power is unavailable.

Portable Changeable Message signs shall be equipped with a power source and a battery back-up to provide continuous operation when failure of the primary power source occurs.

The mounting of Portable Changeable Message signs on a trailer, a large truck, or a service patrol truck shall be such that the bottom of the message sign panel shall be a minimum of 2.1 m (7 ft) above the roadway in urban areas and 1.5 m (5 ft) above the roadway in rural areas when it is in the operating mode.

The text of the messages shall not scroll or travel horizontally or vertically across the face of the sign.

Guidance:

Portable Changeable Message signs should be used as a supplement to and not as a substitute for conventional signs and pavement markings.

When Portable Changeable Message signs are used for route diversion, they should be placed far enough in advance of the diversion to allow road users ample opportunity to perform necessary lane changes, to adjust their speed, or to exit the affected highway.

The Portable Changeable Message signs should be sited and aligned to provide maximum legibility. Multiple Portable Changeable Message signs should be placed on the same side of the roadway, separated from each other at distances based on Table 6C-1.

Portable Changeable Message signs should be placed on the shoulder of the roadway or, if practical, further from the traveled lane. They should be delineated with retroreflective TTC devices. When Portable Changeable Message signs are not being used, they should be removed; if not removed, they should be shielded; or if the previous two options are not feasible, they should be delineated with retroreflective TTC devices.

Portable Changeable Message sign trailers should be delineated on a permanent basis by affixing retroreflective material, known as conspicuity material, in a continuous line on the face of the trailer as seen by oncoming road users. If the sign trailer is located within 4.6 m (15 ft) of the edge of the traveled way, it should be delineated with a taper consisting of 9 cones placed at a spacing of 7.5 m (25 ft) apart.

Standard:

On State highways, the message displayed on Portable Changeable Message signs shall be visible from a distance of 460 m (1500 ft) and shall be legible from a distance of 230 m (750 ft), at noon on a cloudless day, by persons with vision of or corrected to 20/20.

Guidance:

On local roads, the message displayed on Portable Changeable Message signs should be visible from a distance of 460 m (1500 ft) and shall be legible from a distance of 230 m (750 ft), at noon on a cloudless day, by persons with vision of or corrected to 20/20.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.12 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Refer to Section 2B.13 for Vehicle Speed Feedback Signs.

Section 6F.56 Arrow Panels

Standard:

An arrow panel shall be a sign with a matrix of elements capable of either flashing or sequential displays. This sign shall provide additional warning and directional information to assist in merging and controlling road users through or around a TTC zone.

Guidance:

An arrow panel in the arrow or chevron mode should be used to advise approaching traffic of a lane closure along major multi-lane roadways in situations involving heavy traffic volumes, high speeds, and/or limited sight distances, or at other locations and under other conditions where road users are less likely to expect such lane closures.

If used, an arrow panel should be used in combination with appropriate signs, channelizing devices, or other TTC devices.

An arrow panel should be placed on the shoulder of the roadway or, if practical, further from the traveled lane. It should be delineated with retroreflective TTC devices. When an arrow panel is not being used, it should be removed; if not removed, it should be shielded; or if the previous two options are not feasible, it should be delineated with retroreflective TTC devices.

Standard:

Arrow panels shall meet the minimum size, legibility distance, number of elements, and other specifications shown on Figure 6F-6.

Support:

Type A arrow panels are appropriate for use on low-speed urban streets. Type ~~B~~ II arrow panels are appropriate for intermediate-speed facilities and for maintenance or mobile operations on high-speed roadways. Type ~~C~~ I arrow panels are intended to be used on high-speed, high-volume motor vehicle traffic control projects. Type D arrow panels are intended for use on authorized vehicles.

Standard:

Type A, ~~B~~ II, and ~~C~~ I arrow panels shall have solid rectangular appearances. A Type D arrow panel shall conform to the shape of the arrow.

All arrow panels shall be finished in nonreflective black. The arrow panel shall be mounted on a vehicle, a trailer, or other suitable support.

Guidance:

The minimum mounting height of an arrow panel should be 2.1 m (7 ft) from the roadway to the bottom of the panel, except on vehicle-mounted panels, which should be as high as practical.

A vehicle-mounted arrow panel should be provided with remote controls.

Standard:

Arrow panel elements shall be capable of at least a 50 percent dimming from full brilliance. The dimmed mode shall be used for nighttime operation of arrow panels.

Guidance:

Full brilliance should be used for daytime operation of arrow panels.

Standard:

The arrow panel shall have suitable elements capable of the various operating modes. The color presented by the elements shall be yellow.

Guidance:

If an arrow panel consisting of a bulb matrix is used, the elements should be recess-mounted or equipped with an upper hood of not less than 180 degrees.

Standard:

The minimum element on-time shall be 50 percent for the flashing mode, with equal intervals of 25 percent for each sequential phase. The flashing rate shall be not less than 25 nor more than 40 flashes per minute.

An arrow panel shall have the following three mode selections:

A. A Flashing Arrow, Sequential Arrow, or Sequential Chevron mode; and

B. A flashing Double Arrow mode; and

C. A flashing Caution mode.

An arrow panel in the arrow or chevron mode shall be used only for stationary or moving lane closures on multi-lane roadways.

For shoulder work, blocking the shoulder, for roadside work near the shoulder, or for temporarily closing one lane on a two-lane, two-way roadway, an arrow panel shall be used only in the caution mode.

Guidance:

For a stationary lane closure, the arrow panel should be located on the shoulder at the beginning of the merging taper.

Where the shoulder is narrow, the arrow panel should be located in the closed lane.

Standard:

When arrow panels are used to close multiple lanes, a separate arrow panel shall be used for each closed lane.

Guidance:

When arrow panels are used to close multiple lanes, if the first arrow panel is placed on the shoulder, the second arrow panel should be placed in the first closed lane at the beginning of the second merging taper ~~(see Figure 6H-37)~~. When the first arrow panel is placed in the first closed lane, the second arrow panel should be placed in the second closed lane at the downstream end of the second merging taper.

For mobile operations where a lane is closed, the arrow panel should be located to provide adequate separation from the work operation to allow for appropriate reaction by approaching drivers.

Standard:

A vehicle displaying an arrow panel shall be equipped with high-intensity rotating, flashing, oscillating, or strobe lights.

Arrow panel(s) shall not be used to laterally shift traffic.

Option:

A portable changeable message sign may be used to simulate an arrow panel display.

Standard:

The arrow panel shall be located behind any channelizing devices used to transition traffic from the closed lane.

Support:

Department of Transportation's Standard Specifications for flashing arrow panels are in Section 12-3.03. See Section 1A.11 for information regarding this publication.

Standard:

The minimum legibility distance is the distance at which flashing arrow panels shall be legible at noon on a cloudless day and at night by persons with vision of or corrected to 20/20.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.03 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Section 6F.57 High-Level Warning Devices (Flag Trees)

Option:

A high-level warning device (flag tree) may supplement other TTC devices in TTC zones.

Support:

A high-level warning device is designed to be seen over the top of typical passenger cars. A typical high-level warning device is shown in Figure 6F-2.

Standard:

A high-level warning device shall consist of a minimum of two flags with or without a Type B high-intensity flashing warning light. The distance from the roadway to the bottom of the lens of the light and to the lowest point of the flag material shall be not less than 2.4 m (8 ft). The flag shall be 400 mm (16 in) square or larger and shall be orange or fluorescent red-orange in color.

Option:

An appropriate warning sign may be mounted below the flags.

Support:

High-level warning devices are most commonly used in high-density road user situations to warn road users of short-term operations.

Section 6F.58 Channelizing Devices

Standard:

Designs of various channelizing devices shall be as shown in Figure 6F–7.

Support:

The function of channelizing devices is to warn road users of conditions created by work activities in or near the roadway and to guide road users. Channelizing devices include cones, tubular markers, vertical panels, drums, barricades, and temporary raised islands.

Channelizing devices provide for smooth and gradual vehicular traffic flow from one lane to another, onto a bypass or detour, or into a narrower traveled way. They are also used to separate vehicular traffic from the work space, pavement drop-offs, pedestrian or shared-use paths, or opposing directions of vehicular traffic.

Standard:

Devices used to channelize pedestrians shall be detectable to users of long canes and visible to persons having low vision.

Where barricades are used to channelize pedestrians, there shall be continuous detectable bottom and top rails with no gaps between individual barricades to be detectable to users of long canes. The bottom of the bottom rail shall be no higher than 150 mm (6 in) above the ground surface. The top of the top rail shall be no lower than 900 mm (36 in) above the ground surface.

Option:

A gap not exceeding 150 mm (6 in) between the bottom rail and the ground surface may be used to facilitate drainage.

Standard:

If drums, cones, or tubular markers are used to channelize pedestrians, they shall be located such that there are no gaps between the bases of the devices, in order to create a continuous bottom, and the height of each individual drum, cone, or tubular marker shall be no less than 900 mm (36 in) to be detectable to users of long canes.

Guidance:

Channelizing devices should be constructed and ballasted to perform in a predictable manner when inadvertently struck by a vehicle. Channelizing devices should be crashworthy. Fragments or other debris from the device or the ballast should not pose a significant hazard to road users or workers.

The spacing of channelizing devices should not exceed a distance in meters (feet) equal to 0.2 times the speed limit in km/h (1.0 times the speed limit in mph) when used for taper channelization, and a distance in meters (feet) equal to 0.4 times the speed limit in km/h (2.0 times the speed limit in mph) when used for tangent channelization.

When channelizing devices have the potential of leading vehicular traffic out of the intended vehicular traffic space as shown in Figure 6H-39, the channelizing devices should be extended a distance in meters (feet) of 0.4 times the speed limit in km/h (2.0 times the speed limit in mph) beyond the end of the transition area.

The spacing of channelizing devices should not exceed the maximum distances shown in Table 6F-102(CA).

Option:

Warning lights may be added to channelizing devices in areas with frequent fog, snow, or severe roadway curvature, or where visual distractions are present.

Standard:

Warning lights shall flash when placed on channelizing devices used alone or in a cluster to warn of a condition. Warning lights placed on channelizing devices used in a series to channelize road users shall be steady-burn.

The retroreflective material used on channelizing devices shall have a smooth, sealed outer surface that will display a similar color day or night.

Option:

The name and telephone number of the highway agency, contractor, or supplier may be shown on the nonretroreflective surface of all types of channelizing devices.

Standard:

The letters and numbers of the name and telephone number shall be nonretroreflective and not over 50 mm (2 in) in height.

Guidance:

Particular attention should be given to maintaining the channelizing devices to keep them clean, visible, and properly positioned at all times.

Standard:

Devices that are damaged or have lost a significant amount of their retroreflectivity and effectiveness shall be replaced.

Section 6F.59 Cones

Standard:

Cones (see Figure 6F-7, Sheet 1 of 2) shall be predominantly orange and shall be made of a material that can be struck without causing damage to the impacting vehicle. For daytime and low-speed roadways, cones shall be not less than 450 mm (18 in) in height. When cones are used on freeways and other high-speed highways or at night on all highways, or when more conspicuous guidance is needed, cones shall be a minimum of 700 mm (28 in) in height.

For nighttime use, cones shall be retroreflectorized or equipped with lighting devices for maximum visibility. Retroreflectorization of cones that are 700 to 900 mm (28 to 36 in) in height shall be provided by a 150 mm (6 in) wide white band located 75 to 100 mm (3 to 4 in) from the top of the cone and an additional 100 mm (4 in) wide white band located approximately 50 mm (2 in) below the 150 mm (6 in) band.

Retroreflectorization of cones that are more than 900 mm (36 in) in height shall be provided by horizontal, circumferential, alternating orange and white retroreflective stripes that are 100 to 150 mm (4 to 6 in) wide. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflective spaces between the orange and white stripes shall not exceed 75 mm (3 in) in width.

Support:

The 900 mm (36 in) and 1050 mm (42 in) high cones provide additional conspicuity in visually complex environments and for older road users.

Option:

Traffic cones may be used to channelize road users, divide opposing vehicular traffic lanes, divide lanes when two or more lanes are kept open in the same direction, and delineate short duration maintenance and utility work.

Guidance:

Steps should be taken to minimize the possibility of cones being blown over or displaced by wind or moving vehicular traffic.

Cones should not be used for pedestrian channelization or as pedestrian barriers in TTC zones on or along sidewalks unless they are continuous between individual devices and detectable to users of long canes.

Option:

Cones may be doubled up to increase their weight.

Support:

Some cones are constructed with bases that can be filled with ballast. Others have specially weighted bases, or weight such as sandbag rings that can be dropped over the cones and onto the base to provide added stability.

Guidance:

Ballast should be kept to the minimum amount needed.

Option:

Retroreflectorization of 700 mm (28 in) or larger cones may be provided by a 325 mm (13 in) band (sleeve).

Standard:

On State highways, the retroreflectorized bands shall be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Guidance:

On local roads, the retroreflectorized bands should be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.10 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Section 6F.60 Tubular Markers

Standard:

Tubular markers (see Figure 6F-7, Sheet 1 of 2) shall be predominantly orange and shall be not less than 450 mm (18 in) high and 50 mm (2 in) wide facing road users. They shall be made of a material that can be struck without causing damage to the impacting vehicle.

Tubular markers shall be a minimum of 700 mm (28 in) in height when they are used on freeways and other high-speed highways, on all highways during nighttime, or whenever more conspicuous guidance is needed.

For nighttime use, tubular markers shall be retroreflectorized. Retroreflectorization of 700 mm (28 in) or larger tubular markers shall be provided by two 75 mm (3 in) wide white bands placed a maximum of 50 mm (2 in) from the top with a maximum of 150 mm (6 in) between the bands.

Support:

The 1050 mm (42 in) high tubular markers provide additional conspicuity in visually complex environments and for older road users.

Guidance:

Tubular markers should not be used for pedestrian channelization or as pedestrian barriers in TTC zones on or along sidewalks unless they are continuous between individual devices and detectable to users of long canes.

Tubular markers have less visible area than other devices and should be used only where space restrictions do not allow for the use of other more visible devices.

Tubular markers should be stabilized by affixing them to the pavement, by using weighted bases, or weights such as sandbag rings that can be dropped over the tubular markers and onto the base to provide added stability. Ballast should be kept to the minimum amount needed.

Option:

Tubular markers may be used effectively to divide opposing lanes of road users, divide vehicular traffic lanes when two or more lanes of moving motor vehicle traffic are kept open in the same direction, and to delineate the edge of a pavement drop off where space limitations do not allow the use of larger devices.

Standard:

When a noncylindrical tubular marker is used, it shall be attached to the pavement in a manner such that the width facing road users meets the minimum requirements.

A tubular marker shall be attached to the pavement to display the minimum 50 mm (2 in) width to the approaching road users.

On State highways, the retroreflectorized bands shall be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Guidance:

On local roads, the retroreflectorized bands should be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.04 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Section 6F.61 Vertical Panels

Standard:

Vertical panels (see Figure 6F-7, Sheet 1 of 2) shall be 200 to 300 mm (8 to 12 in) in width and at least 600 mm (24 in) in height. They shall have orange and white diagonal stripes and be retroreflectorized.

Vertical panels shall be mounted with the top a minimum of 900 mm (36 in) above the roadway.

Where the height of the vertical panel itself is 900 mm (36 in) or greater, a panel stripe width of 150 (6 in) shall be used.

Guidance:

Vertical panels should be a minimum of 300 mm (12 in) in width.

Option:

Where the height of the vertical panel itself is less than 900 mm (36 in), a panel stripe width of 100 mm (4 in) may be used.

Standard:

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward at an angle of 45 degrees in the direction vehicular traffic is to pass. Vertical panels used on freeways, expressways, and other high-speed roadways shall have a minimum of 169,000 mm^2 (270 in^2) retroreflective area facing vehicular traffic.

Option:

Where space is limited, vertical panels may be used to channelize vehicular traffic, divide opposing lanes, or replace barricades.

Section 6F.62 Drums

Standard:

Drums (see Figure 6F-7, Sheet 1 of 2) used for road user warning or channelization shall be constructed of lightweight, deformable materials. They shall be a minimum of 900 mm (36 in) in height and have at least a 450 mm (18 in) minimum width regardless of orientation. Metal drums shall not be used. The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 100 to 150 mm (4 to 6 in) wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectorized spaces between the orizontal orange and white stripes shall not exceed 75 mm (3 in) wide. Drums shall have closed tops that will not allow collection of construction debris or other debris.

Support:

Drums are highly visible, have good target value, give the appearance of being formidable obstacles and, therefore, command the respect of road users. They are portable enough to be shifted from place to place within a TTC zone in order to accommodate changing conditions, but are generally used in situations where they will remain in place for a prolonged period of time.

Option:

Although drums are most commonly used to channelize or delineate road user flow, they may also be used alone or in groups to mark specific locations.

Guidance:

Drums should not be used for pedestrian channelization or as pedestrian barriers in TTC zones on or along sidewalks unless they are continuous between individual devices and detectable to users of long canes.

Drums should not be weighted with sand, water, or any material to the extent that would make them hazardous to road users or workers when struck. Drums used in regions susceptible to freezing should have drain holes in the bottom so that water will not accumulate and freeze causing a hazard if struck by a road user.

Standard:

Ballast shall not be placed on the top of a drum.

On State highways, the retroreflectorized bands shall be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Guidance:

On local roads, the retroreflectorized bands should be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.04 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Section 6F.63 Type I, II, or III Barricades

Support:

A barricade is a portable or fixed device having from one to three rails with appropriate markings and is used to control road users by closing, restricting, or delineating all or a portion of the right-of-way.

As shown in Figure 6F-7, Sheet 2 of 2, barricades are classified as either Type I, Type II, or Type III.

Standard:

Stripes on barricade rails shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees ~~in the direction road users are to pass.~~ Except as noted in the Option, the stripes shall be 150 mm (6 in) wide.

Guidance:

Stripes on barricade rails should slope downward at an angle of 45 degrees in the direction road users are to pass.

Option:

When rail lengths are less than 900 mm (36 in), 100 mm (4 in) wide stripes may be used.

Standard:

The minimum length for Type I and Type II Barricades shall be 600 mm (24 in), and the minimum length for Type III Barricades shall be 1200 mm (48 in). Each barricade rail shall be 200 to 300 mm (8 to 12 in) wide. Barricades used on freeways, expressways, and other high-speed roadways shall have a minimum of 169,000 mm^2 (270 in^2) of retroreflective area facing road users.

Support:

The Type I and Type II Barricades, 900 mm (36 in) in length with each rail 300 mm (12 in) wide, provide additional conspicuity in visually complex environments and for older road users.

Guidance:

Where barricades extend entirely across a roadway, the stripes should slope downward in the direction toward which road users must turn.

Where both right and left turns are provided, the barricade stripes should slope downward in both directions from the center of the barricade or barricades.

Where no turns are intended, the stripes should be positioned to slope downward toward the center of the barricade or barricades.

Barricade rails should be supported in a manner that will allow them to be seen by the road user, and in a manner that provides a stable support that is not easily blown over or displaced.

The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable width of the sidewalk, temporary pathway, or other pedestrian facility. When it is not possible to maintain a minimum width of 1500 mm (60 in) throughout the entire length of the pedestrian pathway, a 1500 x 1500 mm (60 x 60 in) passing space should be provided at least every 60 m (200 ft) to allow individuals in wheelchairs to pass.

Barricade rail supports should not project into pedestrian circulation routes more than 100 mm (4 in) from the support between 675 mm (27 in) and 2000 mm (80 in) from the surface as described in Section 4.4.1 of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11).

Option:

For Type I Barricades, the support may include other unstriped horizontal panels necessary to provide stability.

Guidance:

Barricades should be crashworthy as they are located adjacent to vehicular traffic flow and are subject to impact by errant vehicles.

On high-speed expressways or in other situations where barricades may be susceptible to overturning in the wind, ballasting should be used.

Option:

Sandbags may be placed on the lower parts of the frame or the stays of barricades to provide the required ballast.

Standard:

Ballast shall not be placed on top of any striped rail. Barricades shall not be ballasted by nondeformable objects such as rocks or chunks of concrete. Ballast shall not extend into the accessible passage width of 1500 mm (60 in).

Support:

Type I or Type II Barricades are intended for use in situations where road user flow is maintained through the TTC zone.

Option:

Barricades may be used alone or in groups to mark a specific condition or they may be used in a series for channelizing road users.

Type I Barricades may be used on conventional roads or urban streets.

Guidance:

Type II or Type III Barricades should be used on freeways and expressways or other high-speed roadways. Type III Barricades should be used to close or partially close a road.

Option:

Type III Barricades used at a road closure may be placed completely across a roadway or from curb to curb.

Guidance:

Where provision is made for access of authorized equipment and vehicles, the responsibility for Type III Barricades should be assigned to a person who will provide proper closure at the end of each work day.

Support:

When a highway is legally closed but access must still be allowed for local road users, barricades usually are not extended completely across the roadway.

Standard:

A sign (see Section 6F.09) shall be installed with the appropriate legend concerning permissible use by local road users. Adequate visibility of the barricades from both directions shall be provided.

Option:

Signs may be installed on barricades (see Section 6F.03).

Section 6F.64 Direction Indicator Barricades

Standard:

The Direction Indicator Barricade (see Figure 6F-7, Sheet 2 of 2) shall consist of a One-Direction Large Arrow (W1-6) sign mounted above a diagonal striped, horizontally aligned, retroreflective rail.

The One-Direction Large Arrow (W1-6) sign shall be black on an orange background. The stripes on the bottom rail shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. The stripes shall be 100 mm (4 in) wide. The One- Direction Large Arrow (W1-6) sign shall be 600 x 300 mm (24 x 12 in). The bottom rail shall have a length of 600 mm (24 in) and a height of 200 mm (8 in).

Guidance:

The Direction Indicator Barricade, including any associated ballast or lights, should be crashworthy.

Option:

The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.

Guidance:

If used, Direction Indicator Barricades should be used in series to direct the driver through the transition and into the intended travel lane.

Section 6F.65 Temporary Traffic Barriers as Channelizing Devices

Support:

Temporary traffic barriers are not TTC devices in themselves; however, when placed in a position identical to a line of channelizing devices and marked and/or equipped with appropriate channelization features to provide guidance and warning both day and night, they serve as TTC devices.

Standard:

Temporary traffic barriers serving as TTC devices shall conform to requirements for such devices as set forth throughout Part 6.

Temporary traffic barriers shall not be used solely to channelize road users, but also to protect the work space (see Section 6F.81). If used to channelize vehicular traffic, the temporary traffic barrier shall be supplemented with delineation, pavement markings, or channelizing devices for improved daytime and nighttime visibility.

Guidance:

Temporary traffic barriers should not be used for a merging taper except in low-speed urban areas. Temporary traffic barriers should not be used for a constricted/restricted TTC zone.

When it is necessary to use a temporary traffic barrier for a merging taper in low-speed urban areas or for a constricted/restricted TTC zone, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.

When used for channelization, temporary traffic barriers should be of a light color for increased visibility.

Option:

Side reflectors with cube-corner lenses or top mounted reflectors (facing the driver) may be used on temporary traffic barriers.

Guidance:

If used, the spacing of these reflectors should not exceed a distance in meters (feet) equal to 0.2 times the speed limit in km/h (1.0 times the speed limit in mph) through the TTC zone.

Section 6F.66 Longitudinal Channelizing Barricades

Support:

Longitudinal channelizing barricades are lightweight, deformable channelizing devices that can be used singly as Type I, II, or III barricades, or connected so they are highly visible and have good target value.

Guidance:

When used as a barricade, longitudinal channelizing barricades should conform to the general size, color, stripe pattern, retroreflectivity, and placement characteristics established for the devices described in Chapter 6F.

Option:

Longitudinal channelizing barricades may be used instead of a line of cones, drums, or barricades.

Longitudinal channelizing barricades may be hollow and filled with water as a ballast.

Guidance:

If used, longitudinal channelizing barricades should be interlocked to delineate or channelize flow including pedestrian traffic control. The interlocking barricade wall should not have gaps that allow pedestrians or vehicles to stray from the channelizing path.

Support:

Longitudinal channelizing barricades are often located adjacent to traffic and therefore are subject to impact by errant vehicles.

Guidance:

Because of their vulnerable position, longitudinal channelizing barricades should be constructed of lightweight materials and be crashworthy.

Although longitudinal channelizing barricades might give the appearance of being formidable obstacles, they have not met the crashworthy requirements for temporary traffic barriers and, therefore, should not be used to shield pedestrians, including workers, from vehicle impacts or obstacles.

Option:

Longitudinal channelizing barricades may be used to channelize pedestrians.

Section 6F.67 Other Channelizing Devices

Option:

Channelizing devices other than those described in this Chapter may be used in special situations based on an engineering study.

Guidance:

Other channelizing devices should conform to the general size, color, stripe pattern, retroreflection, and placement characteristics established for the devices described in this Chapter.

Section 6F.68 Detectable Edging for Pedestrians

Support:

Individual channelizing devices, tape or rope used to connect individual devices, other discontinuous barriers and devices, and pavement markings are not detectable by persons with visual disabilities and are incapable of providing detectable path guidance on temporary or realigned sidewalks or other pedestrian facilities.

Guidance:

When it is determined that a facility should be accessible to and detectable by pedestrians with visual disabilities, a continuously detectable edging should be provided throughout the length of the facility such that it can be followed by pedestrians using long canes for guidance. This edging should protrude at least 150 mm (6 in) above the surface of the sidewalk or pathway, with the bottom of the edging a maximum of 62 mm (2.5 in) above the surface. This edging should be continuous throughout the length of the facility except for gaps at locations where pedestrians or vehicles will be turning or crossing. This edging should consist of a prefabricated or formed-in-place curbing or other continuous device that is placed along the edge of the sidewalk or walkway. This edging should be firmly attached to the ground or to other devices. Adjacent sections of this edging should be interconnected such that the edging is not displaced by pedestrian or vehicular traffic or work operations, and such that it does not constitute a hazard to pedestrians, workers, or other road users.

Support:

Examples of detectable edging for pedestrians include:

A. Prefabricated lightweight sections of plastic, metal, or other suitable materials that are interconnected and fixed in place to form a continuous edge.
B. Prefabricated lightweight sections of plastic, metal, or other suitable materials that are interconnected, fixed in place, and placed at ground level to provide a continuous connection between channelizing devices located at intervals along the edge of the sidewalk or walkway.
C. Sections of lumber interconnected and fixed in place to form a continuous edge.
D. Formed-in-place asphalt or concrete curb.
E. Prefabricated concrete curb sections that are interconnected and fixed in place to form a continuous edge.
F. Continuous temporary traffic barrier or longitudinal channelizing barricades placed along the edge of the sidewalk or walkway that provides a pedestrian edging at ground level.
G. Chain link or other fencing equipped with a continuous bottom rail.

Guidance:

Detectable pedestrian edging should be orange, white, or yellow and should match the color of the adjacent channelizing devices or traffic control devices, if any are present.

Section 6F.69 Temporary Raised Islands

Standard:

Temporary raised islands shall be used only in combination with pavement striping and other suitable channelizing devices.

Option:

A temporary raised island may be used to separate vehicular traffic flows in two-lane, two-way operations on roadways having a vehicular traffic volume range of 4,000 to 15,000 average daily traffic (ADT) and on freeways having a vehicular traffic volume range of 22,000 ADT to 60,000 ADT.

Temporary raised islands also may be used in other than two-lane, two-way operations where physical separation of vehicular traffic from the TTC zone is not required.

Guidance:

Temporary raised islands should have the basic dimensions of 100 mm (4 in) high by at least 450 mm (18 in) wide and have rounded or chamfered corners.

The temporary raised islands should not be designed in such a manner that they would cause a motorist to lose control of the vehicle if the vehicle inadvertently strikes the temporary raised island. If struck, pieces of the island should not be dislodged to the extent that they could penetrate the occupant compartment or involve other vehicles.

Standard:

At pedestrian crossing locations, temporary raised islands shall have an opening or be shortened to provide at least a 1500 mm (60 in) wide pathway for the crossing pedestrian.

Section 6F.70 Opposing Traffic Lane Divider

Support:

Opposing traffic lane dividers are delineation devices used as center lane dividers to separate opposing vehicular traffic on a two-lane, two-way operation.

Standard:

Opposing traffic lane dividers shall not be placed across pedestrian crossings.

The Opposing Traffic Lane Divider (W6-4) sign (see Figure 6F-4, Sheet 2 of 4) is an upright, retroreflective orange-colored sign placed on a flexible support and sized at least 300 mm (12 in) wide by 450 mm (18 in) high.

Guidance:

The Opposing Traffic Lane Divider (W6-4) sign should only be used to supplement a channelizing device that is being used to separate opposing traffic in a maintenance or construction work zone.

Section 6F.71 Pavement Markings

Standard:

The provisions of this Section shall not be considered applicable for short-term, mobile, or incident management TTC zones.

Pavement markings shall be maintained along paved streets and highways in all long- and intermediate-term stationary (see Section 6G.02) TTC zones. All pavement markings shall be in accordance with Chapters 3A and 3B, except as indicated in Section 6F.72. Pavement markings shall match the markings in place at both ends of the TTC zone. Pavement markings shall be placed along the entire length of any surfaced detour or temporary roadway prior to the detour or roadway being opened to road users.

Warning signs, channelizing devices, and delineation shall be used to indicate required road user paths in TTC zones where it is not possible to provide a clear path by pavement markings. All pavement markings and devices used to delineate road user paths shall be carefully reviewed during daytime and nighttime periods.

For long-term stationary operations, pavement markings in the temporary traveled way that are no longer applicable shall be removed or obliterated as soon as practical. Pavement marking obliteration shall leave a minimum of pavement scars and shall remove old marking material. Painting

over existing pavement markings with black paint or spraying with asphalt shall not be accepted as a substitute for removal or obliteration.

Guidance:

Road users should be provided pavement markings within a TTC zone comparable to the pavement markings normally maintained along such roadways, particularly at either end of the TTC zone.

The intended vehicle path should be defined in day, night, and twilight periods under both wet and dry pavement conditions.

The work should be planned and staged to provide for the placement and removal of the pavement markings.

Markings should be provided in intermediate-term stationary work zones.

Option:

Removable, nonreflective, preformed tape may be used where markings need to be covered temporarily.

Guidance:

Centerlines and lane lines should be placed, replaced, or delineated where appropriate before the roadway is opened to traffic.

Section 6F.72 Temporary Pavement Markings

Support:

Temporary pavement markings are those that are allowed to remain in place until the earliest date when it is practical and possible to install pavement markings that meet the Part 3 standards for pavement markings.

Guidance:

Temporary pavement markings should not be in place for more than 2 weeks unless justified by an engineering study.

Standard:

All temporary pavement markings, including pavement markings for no-passing zones, shall conform to the requirements of Chapters 3A and 3B. All temporary broken-line pavement markings shall use the same cycle length as permanent markings and be at least 0.6 m (2 ft) long.

Option:

Half-cycle lengths with a minimum of 0.6 m (2 ft) stripes may be used on roadways with severe curvature (see Section 3A.05) for centerlines in passing zones and for lane lines.

For temporary situations of 3 calendar days or less, for a two- or three-lane road, no-passing zones may be identified by using DO NOT PASS (R4-1), PASS WITH CARE (R4-2), and NO PASSING ZONE (W14-3) signs (see Sections 2B.29, 2B.30, and 2C.35) rather than pavement markings. Also, DO NOT PASS, PASS WITH CARE, and NO PASSING ZONE signs may be used instead of pavement markings on roads with low volumes for longer periods in accordance with the State's or highway agency's policy.

Guidance:

If used, the DO NOT PASS, PASS WITH CARE, and NO PASSING ZONE signs should be placed in accordance with Sections 2B.29, 2B.30, and 2C.35.

The temporary use of edge lines, channelizing lines, lane reduction transitions, gore markings, and other longitudinal markings, and the various nonlongitudinal markings (such as stop lines, railroad crossings, crosswalks, words or symbols) should be in accordance with the State's or highway agency's policy.

Standard:

Temporary lane lines and/or centerlines shall consist of retroreflectorized lines approximately 600 mm (24 in) long, 100 mm (4 in) wide, spaced approximately 7.3 m (24 ft) apart.

Option:

Day/night raised retroreflectorized pavement markers, approved by the Department of Transportation, may be used in lieu of 600 mm (24 in) lines, spaced approximately 7.3 m (24 ft) apart.

Guidance:

Right edge lines should not be simulated with dashed lines or raised pavement markers because they could confuse motorists.

Option:

Portable delineators, permanent type delineators, etc., may be used where it is considered desirable to enhance the edge of traveled way due to curvilinear alignment, narrowing pavement, etc.

Standard:

Locations on two-lane conventional highways where no-passing zone centerline delineation has been obliterated shall be posted with a sign package consisting of a ROAD (STREET) WORK (W20-1) sign and a DO NOT PASS (R4-1) sign.

Guidance:

The R4-1 sign should be posted at 600 m (2000 ft) intervals throughout the extended no-pass zone. A PASS WITH CARE (R4-2) sign should also be placed at the end of the zone.

Section 6F.73 Raised Pavement Markers

Standard:

~~**If raised pavement markers are used to substitute for broken line segments, at least two retroreflective markers shall be placed, one at each end of a segment of 0.6 to 1.5 m (2 to 5 ft) in length. For segments longer than 1.5 m (5 ft), a group of at least three retroreflective markers shall be equally spaced at no greater than N/8 (see Section 3B.11). The value of N for a broken or dotted line shall equal the length of one line segment plus one gap. The value of N referenced for solid lines shall equal the N for the broken or dotted lines that might be adjacent to or might extend the solid lines (see Sections 3B.13 and 3B.14).**~~

If raised pavement markers are used to substitute for broken line segments, at least two retroreflective markers shall be placed, one at each end of a segment of 0.9 m (3 ft). For segments over 2.4 m (8 ft), a group of at least three retroreflective markers shall be equally spaced at no greater than 1.2 m (4 ft). See Section 3A.05 for more details.

Guidance:

Raised pavement markers should be considered for use along surfaced detours or temporary roadways, and other changed or new travel-lane alignments.

Option:

Retroreflective or internally illuminated raised pavement markers, or nonretroreflective raised pavement markers supplemented by retroreflective or internally illuminated markers, may replace or supplement markings prescribed in Chapters 3A and 3B.

Section 6F.74 Delineators

Standard:

When used, delineators shall combine with or supplement other TTC devices. They shall be mounted on crashworthy supports so that the reflecting unit is approximately 1.2 m (4 ft) above the near roadway edge. The standard color for delineators used along both sides of two-way streets and highways and the right side of one-way roadways shall be white. Delineators used along the left side of one-way roadways shall be yellow.

Guidance:

Spacing along roadway curves should be as set forth in Section 3D.04 and should be such that several delineators are always visible to the driver.

Option:

Delineators may be used in TTC zones to indicate the alignment of the roadway and to outline the required vehicle path through the TTC zone.

Standard:

On State highways, the retroreflectorized bands shall be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

The delineators shall be placed 0.6 m (2 ft) to 1.8 m (6 ft) outside the outer edge of the shoulder. They shall be 75 x 300 mm (3 x 12 in) minimum size.

Guidance:

On local roads, the retroreflectorized bands should be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.04 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Section 6F.75 Lighting Devices

Guidance:

Lighting devices should be provided in TTC zones based on engineering judgment.

When used to supplement channelization, the maximum spacing for warning lights should be identical to the channelizing device spacing requirements.

Support:

Four types of lighting devices are commonly used in TTC zones. They are floodlights, flashing warning beacons, warning lights, and steady-burn electric lamps.

Option:

Lighting devices may be used to supplement retroreflectorized signs, barriers, and channelizing devices.

During normal daytime maintenance operations, the functions of flashing warning beacons may be provided by high-intensity rotating, flashing, oscillating, or strobe lights on a maintenance vehicle.

Standard:

Although vehicle hazard warning lights are permitted to be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights, they shall not be used instead of high-intensity rotating, flashing, oscillating, or strobe lights.

Section 6F.76 Floodlights

Support:

Utility, maintenance, or construction activities on highways are frequently conducted during nighttime periods when vehicular traffic volumes are lower. Large construction projects are sometimes operated on a double-shift basis requiring night work (see Section 6G.20).

Guidance:

When nighttime work is being performed, floodlights should be used to illuminate the ~~work area~~, equipment crossings, and other areas.

Standard:

When nighttime work is being performed, floodlights shall be used to illuminate the work area.

Except in emergency situations, flagger stations shall be illuminated at night.

Floodlighting shall not produce a disabling glare condition for approaching road users, flaggers, or workers.

Guidance:

The adequacy of the floodlight placement and elimination of potential glare should be determined by driving through and observing the floodlighted area from each direction on all approaching roadways after the initial floodlight setup, at night, and periodically.

Support:

Desired illumination levels vary depending upon the nature of the task involved. An average horizontal luminance of ~~50 lux (5 foot candles)~~ 108 lux (10 foot candles) can be adequate for general activities. Tasks requiring high levels of precision and extreme care can require an average horizontal luminance of 216 lux (20 foot candles).

Refer to Construction Safety Orders in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 4, Article 3, Section 1523 – Illumination and Section 1599 - Flaggers) for the above modifications. See See Section 1A.11 for information regarding this publication.

Section 6F.77 Flashing Warning Beacons

Support:

Flashing warning beacons are often used to supplement a TTC device.

Standard:

Flashing warning beacons shall comply with the provisions of Chapter 4K. A flashing warning beacon shall be a flashing yellow light with a minimum nominal diameter of ~~200 mm (8 in)~~ 300 mm (12 in).

Guidance:

Flashing warning beacons should be operated 24 hours per day.

Support:

The temporary terminus of a freeway is an example of a location where flashing warning beacons alert drivers to the changing roadway conditions and the need to reduce speed in transitioning from the freeway to another roadway type.

Standard:

The beacon lens shall have a visible diameter of 300 mm (12 in) and shall conform to Department of Transportation's standards for signal lenses, and the lighting unit shall have a visor and back plate or other suitable means of providing adequate contrast.

The mounting height shall be between 1.8 m (6 ft) and 3 m (10 ft), measured from the bottom of the base to the center of the lens.

Section 6F.78 Warning Lights

Support:

Type A, Type B, Type C, and Type D 360-degree warning lights are portable, powered, yellow, lens-directed, enclosed lights.

Standard:

Warning lights shall be in accordance with the current ITE "Purchase Specification for Flashing and Steady-Burn Warning Lights" (see Section 1A.11).

When warning lights are used, they shall be mounted on signs or channelizing devices in a manner that, if hit by an errant vehicle, they will not be likely to penetrate the windshield.

Guidance:

The maximum spacing for warning lights should be identical to the channelizing device spacing requirements.

Support:

The light weight and portability of warning lights are advantages that make these devices useful as supplements to the retroreflectorization on signs and channelizing devices. The flashing lights are effective in attracting road users' attention.

Option:

Warning lights may be used in either a steady-burn or flashing mode.

Standard:

Flashing warning lights shall not be used for delineation, as a series of flashers fails to identify the desired vehicle path.

Type A Low-Intensity Flashing warning lights, Type C Steady-Burn warning lights, and Type D 360- degree Steady-Burn warning lights shall be maintained so as to be capable of being visible on a clear night from a distance of 900 m (3,000 ft). Type B High-Intensity Flashing warning lights shall be maintained so as to be capable of being visible on a sunny day when viewed without the sun directly on or behind the device from a distance of 300 m (1,000 ft).

Warning lights shall have a minimum mounting height of 750 mm (30 in) to the bottom of the lens.

Support:

Type A Low-Intensity Flashing warning lights are used to warn road users during nighttime hours that they are approaching or proceeding in a potentially hazardous area.

Option:

Type A warning lights may be mounted on channelizing devices.

Support:

Type B High-Intensity Flashing warning lights are used to warn road users during both daylight and nighttime hours that they are approaching a potentially hazardous area.

Option:

Type B warning lights are designed to operate 24 hours per day and may be mounted on advance warning signs or on independent supports.

Type C Steady-Burn warning lights and Type D 360-degree Steady-Burn warning lights may be used during nighttime hours to delineate the edge of the traveled way.

Guidance:

When used to delineate a curve, Type C and Type D 360-degree warning lights should only be used on devices on the outside of the curve, and not on the inside of the curve.

Section 6F.79 Steady-Burn Electric Lamps

Support:

Steady-Burn electric lamps are a series of low-wattage, yellow, electric lamps, generally hard-wired to a 110-volt external power source.

Option:

Steady-Burn electric lamps may be used in place of Type C Steady-Burn warning lights (see Section 6F.78).

Section 6F.80 Temporary Traffic Control Signals

Standard:

Temporary traffic control signals (see Section 4D.20) used to control road user movements through TTC zones and in other TTC situations shall meet the applicable provisions of Part 4 and for State highways, the Department of Transportation's Standard Plans and/or Special Provisions. See Section 1A.11 for information regarding this publication.

Support:

Temporary traffic control signals are typically used in TTC zones such as temporary haul road crossings; temporary one-way operations along a one-lane, two-way highway; temporary one-way operations on bridges, reversible lanes, and intersections.

Standard:

One-lane, two-way vehicular traffic flow (see Chapter 4G) requires an all-red interval of sufficient duration for road users to clear the portion of the TTC zone controlled by the traffic control signals. Safeguards shall be incorporated to avoid the possibility of conflicting signal indications at each end of the TTC zone.

Guidance:

Where pedestrian traffic is detoured to a temporary traffic control signal, engineering judgment should be used to determine if pedestrian signals or accessible pedestrian signals (see Section 4E.06) are needed for crossing along an alternate route.

When temporary traffic control signals are used, conflict monitors typical of traditional traffic control signal operations should be used.

Option:

Temporary traffic control signals may be portable or temporarily mounted on fixed supports.

Standard:

The supports for temporary traffic control signals shall not encroach into the minimum required width of a "pedestrian access route" of 1200 mm (48 in) or an "alternate circulation path" of 900 mm (36 in).

Guidance:

Temporary traffic control signals should only be used in situations where temporary traffic control signals are preferable to other means of traffic control, such as changing the work staging or work zone size to eliminate one-way vehicular traffic movements, using flaggers to control one-way or crossing movements, using STOP or YIELD signs, and using warning devices alone.

Support:

Factors related to the design and application of temporary traffic control signals include the following:

A. Safety and road user needs;
B. Work staging and operations;
C. The feasibility of using other TTC strategies (for example, flaggers, providing space for two lanes, or detouring road users, including bicyclists and pedestrians);
D. Sight distance restrictions;
E. Human factors considerations (for example, lack of driver familiarity with temporary traffic control signals);
F. Road-user volumes including roadway and intersection capacity;
G. Affected side streets and driveways;
H. Vehicle speeds;
I. The placement of other TTC devices;
J. Parking;
K. Turning restrictions;
L. Pedestrians;
M. The nature of adjacent land uses (such as residential or commercial);
N. Legal authority;
O. Signal phasing and timing requirements;
P. Full-time or part-time operation;
Q. Actuated, fixed-time, or manual operation;
R. Power failures or other emergencies;
S. Inspection and maintenance needs;
T. Need for detailed placement, timing, and operation records; and
U. Operation by contractors or by others.

Although temporary traffic control signals can be mounted on trailers or lightweight portable supports, fixed supports offer superior resistance to displacement or damage by severe weather, vehicle impact, and vandalism.

Guidance:

Other TTC devices should be used to supplement temporary traffic control signals, including warning and regulatory signs, pavement markings, and channelizing devices.

The design and placement of temporary traffic control signals should include interconnection to other traffic control signals along the subject roadway.

Temporary traffic control signals not in use should be covered or removed.

Section 6F.81 Temporary Traffic Barriers

Support:

Temporary traffic barriers are devices designed to help prevent penetration by vehicles while minimizing injuries to vehicle occupants, and are designed to protect workers, bicyclists, and pedestrians.

The four primary functions of temporary traffic barriers are:

A. To keep vehicular traffic from entering work areas, such as excavations or material storage sites;
B. To separate workers, bicyclists, and pedestrians from motor vehicle traffic;
C. To separate opposing directions of vehicular traffic; and
D. To separate vehicular traffic, bicyclists, and pedestrians from the work area such as false work for bridges and other exposed objects.

Option:

Temporary traffic barriers, including shifting portable or movable barrier installations to accommodate varying directional vehicular traffic demands, may be used to separate two-way vehicular traffic.

Guidance:

Because the protective requirements of a TTC situation have priority in determining the need for temporary traffic barriers, their use should be based on an engineering study. When serving the additional

function of channelizing vehicular traffic (see Section 6F.65), temporary traffic barriers should be a light color for increased visibility.

Standard:

Temporary traffic barriers shall be supplemented with standard delineation, pavement markings, or channelizing devices for improved daytime and nighttime visibility if they are used to channelize vehicular traffic. The delineation color shall match the applicable pavement marking color.

In order to mitigate the effect of striking the end of a temporary traffic barrier, the end shall be installed in accordance with AASHTO's "Roadside Design Guide" (see Section 1A.11) by flaring until the end is outside the acceptable clear zone or by providing crashworthy end treatments.

Option:

Warning lights or steady-burn electric lamps may be mounted on temporary traffic barrier installations.

Side reflectors with cube-corner lenses or top mounted reflectors (facing the driver) may be used on temporary traffic barriers.

Guidance:

If used, the spacing of these reflectors should not exceed a distance in meters (feet) equal to 0.2 times the speed limit in km/h (1.0 times the speed limit in mph) through the TTC zone.

Support:

A movable barrier is a linear system of connected barrier segments that can rapidly be shifted laterally by using a specially designed transfer vehicle. The transfer is accomplished in a manner that does not interfere with vehicular traffic in adjacent lanes. Applications of movable barriers include the following:

A. Closing an additional lane during work periods while maintaining the advantage of having the travel way separated from the work space by a barrier;
B. Closing an additional lane during off-peak periods to provide extra space for work activities without adversely impacting vehicular traffic flow; and
C. Creating a temporary reversible lane, thus providing unbalanced capacity favoring the major direction of vehicular traffic flow.

More specific information on the use of temporary traffic barriers is contained in Chapters 8 and 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11).

Support:

More specific information on the use of portable barriers and crash cushions can be obtained from the Department of Transportation's Standard Plans and Standard Specifications. See Section 1A.11 for information regarding this publication.

Section 6F.82 Crash Cushions

Support:

Crash cushions are systems that mitigate the effects of errant vehicles that strike obstacles, either by smoothly decelerating the vehicle to a stop when hit head-on, or by redirecting the errant vehicle. The two types of crash cushions that are used in TTC zones are stationary crash cushions and truck-mounted attenuators. Crash cushions in TTC zones help protect the drivers from the exposed ends of barriers, fixed objects, shadow vehicles, and other obstacles. Specific information on the use of crash cushions can be found in AASHTO's "Roadside Design Guide" (see Section 1A.11).

Standard:

Crash cushions shall be crashworthy. They shall also be designed for each application to stop or redirect errant vehicles under prescribed conditions. Crash cushions shall be periodically inspected to verify that they have not been hit or damaged. Damaged crash cushions shall be promptly repaired or replaced to maintain their crashworthiness.

Support:

Stationary crash cushions are used in the same manner as permanent highway installations to protect drivers from the exposed ends of barriers, fixed objects, and other obstacles.

Standard:

Stationary crash cushions shall be designed for the specific application intended.

Truck-mounted attenuators shall be energy-absorbing devices attached to the rear of shadow trailers or trucks. If used, the shadow vehicle with the attenuator shall be located in advance of the work area, workers, or equipment to reduce the severity of rear-end crashes from errant vehicles.

Support:

Trucks or trailers are often used as shadow vehicles to protect workers or work equipment from errant vehicles. These shadow vehicles are normally equipped with flashing arrows, changeable message signs, and/or high-intensity rotating, flashing, oscillating, or strobe lights located properly in advance of the workers and/or equipment that they are protecting. However, these shadow vehicles might themselves cause injuries to occupants of the errant vehicles if they are not equipped with truck-mounted attenuators.

Guidance:

The shadow truck should be positioned a sufficient distance in advance of the workers or equipment being protected so that there will be sufficient distance, but not so much so that errant vehicles will travel around the shadow truck and strike the protected workers and/or equipment.

Support:

Chapter 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11) contains additional information regarding the use of shadow vehicles.

Guidance:

If used, the truck-mounted attenuator should be used in accordance with the manufacturer's specifications.

Support:

Information about designs and types of crash cushions currently approved for use on State highways is available from Department of Transportation's Division of Traffic Operations in Sacramento. A list of approved products is available on the Internet at the following web address:

http://www.dot.ca.gov/hq/esc/approved_products_list/HighwaySafe.htm

Section 6F.83 Vehicle-Arresting Systems

Support:

Vehicle-arresting systems are designed to prevent penetration into activity areas while providing for smooth, reasonably safe deceleration for the errant vehicles. They can consist of portable netting, cables, and energy absorbing anchors.

Guidance:

When used, a vehicle-arresting system should be used in accordance with the manufacturer's specifications, and should be located so that vehicles are not likely to penetrate the location that the system is designed to protect.

Section 6F.84 Rumble Strips

Support:

Transverse rumble strips consist of intermittent narrow, transverse areas of rough-textured or slightly raised or depressed road surface that extend across the travel lanes to alert drivers to unusual vehicular traffic conditions. Through noise and vibration they attract the driver's attention to such features as unexpected changes in alignment and to conditions requiring a stop.

Longitudinal rumble strips consist of a series of rough-textured or slightly raised or depressed road surfaces located along the shoulder to alert road users that they are leaving the travel lanes.

Standard:

If it is desirable to use a color other than the color of the pavement for a longitudinal rumble strip, the color of the rumble strip shall be the same color as the longitudinal line the rumble strip supplements.

If the color of a transverse rumble strip used within a travel lane is not the color of the pavement, the color of the rumble strip shall be white.

Option:

Intervals between transverse rumble strips may be reduced as the distance to the approached conditions is diminished in order to convey an impression that a closure speed is too fast and/or that an action is

imminent. A sign warning drivers of the onset of rumble strips may be placed in advance of any transverse rumble strip installation.

Guidance:

Transverse rumble strips should be placed transverse to vehicular traffic movement. They should not adversely affect overall pavement skid resistance under wet or dry conditions.

In urban areas, even though a closer spacing might be warranted, transverse rumble strips should be designed in a manner that does not promote unnecessary braking or erratic steering maneuvers by road users.

Transverse rumble strips should not be placed on sharp horizontal or vertical curves.

Rumble strips should not be placed through pedestrian crossings or on bicycle routes.

Transverse rumble strips should not be placed on roadways used by bicyclists unless a minimum clear path of 1.2 m (4 ft) is provided at each edge of the roadway or on each paved shoulder as described in AASHTO's "Guide to the Development of Bicycle Facilities" (see Section 1A.11).

Longitudinal rumble strips should not be placed on the shoulder of a roadway that is used by bicyclists unless a minimum clear path of 1.2 m (4 ft) is also provided on the shoulder.

Support:

Rumble strips are not suitable as a riding surface for bicycles and motorcycles.

Refer to Section 3B.106(CA) for more details on rumble strips.

Guidance:

Where cyclists are permitted, provisions should be made to allow passage through or around the rumble strips.

Section 6F.85 Screens

Support:

Screens are used to block the road users' view of activities that can be distracting. Screens might improve safety and motor vehicle traffic flow where volumes approach the roadway capacity because they discourage gawking and reduce headlight glare from oncoming motor vehicle traffic.

Guidance:

Screens should not be mounted where they could adversely restrict road user visibility and sight distance and adversely affect the reasonably safe operation of vehicles.

Option:

Screens may be mounted on the top of temporary traffic barriers that separate two-way motor vehicle traffic.

Temporary traffic screen may be mounted on top of temporary traffic barriers, when barriers are used in transition and crossover areas for glare-control on high-volume roadways.

Guidance:

If used, temporary traffic screen panels should be contiguous without gaps, minimum 813 mm (32 in) in height, and orange or red-orange in color.

Guidance:

Design of screens should be in accordance with Chapter 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11).

Section 6F.86 Future and Experimental Devices

Support:

The States, FHWA, AASHTO, the Transportation Research Board, and other organizations conduct research and experimentation on new traffic control and safety devices. Users of this Manual are encouraged to stay abreast of these current efforts and to use such devices with care so as to avoid presenting road users with unusual or confusing situations that might be abnormal or unexpected.

Standard:

New traffic control devices shall conform to the provisions for design, use, and application set forth in this Manual. New traffic control devices that do not conform with the provisions in this Manual shall be subject to experimentation, documentation, and adoption following the provisions of Section 1A.10.

Section 6F.101(CA) Channelizers (Permanent type, flexible post)

Support:

Channelizers are implanted in the ground or affixed to the pavement, and are not susceptible to displacement, and are capable of normally withstanding numerous vehicular impacts.

Channelizers are generally used in series to create a visual fence/barrier, to provide additional guidance and/or restriction to traffic.

Option:

They also may be used in lieu of cones, portable delineators, or drums, to channelize traffic, divide opposing lanes of traffic, etc.

Standard:

The design of a channelizer shall be as shown in Figure 6F-102(CA).

The height shall be 900 mm (36 in) minimum (700 mm (28 in) where speeds are 65 km/h (40 mph) or less), the width of the post shall be 56 mm (2 ¼ in) minimum and the color predominantly orange. The 75 x 300 mm (3 x 12 in) minimum retroreflective unit shall be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

The color of the channelizer retroreflective unit shall be white and posts shall be orange.

Support:

Refer to Department of Transportation's Standard Specifications Section 12-3.07 for visibility criteria cited. See Section 1A.11 for information regarding this publication.

Refer Chapter 3F for other details and requirements of channelizers.

Section 6F.102(CA) LOOSE GRAVEL Sign (W8-7)

Guidance:

The LOOSE GRAVEL (W8-7) sign should be used on chip seal jobs or other areas to warn motorists that there is loose gravel on the roadway.

Standard:

When used, the W8-7 sign shall be placed at the beginning of work and at maximum 610 m (2000 ft) intervals.

Option:

The Advisory Speed (W13-1) plaque may be used in combination with the W8-7 sign to indicate the need to decrease speed at a particular location.

Guidance:

The advisory speed should be reasonable or prudent, considering weather, visibility, traffic, surface condition and width of the roadway.

Standard:

On State highways for seal coat projects, the W13-1 (35) plaque shall supplement the W8-7 sign during placing and/or brooming of screenings.

Section 6F.103(CA) NARROW LANE(S) Sign (C12(CA))

Option:

The NARROW LANE(S) (C12(CA)) sign may be used, when appropriate, to warn the approaching motorist of a narrow lane condition.

Guidance:

When used, the C12(CA) sign should be used in conjunction with an Advisory Speed (W13-1) plaque. See Section 2C.46.

Section 6F.104(CA) Road Work/Speed Limit Sign (C17(CA))

Standard:

The Road Work/Speed Limit (C17(CA)) sign shall not be used on State highways.

The C17(CA) sign shall only be used in conjunction with appropriate advance warning signs.

The C17(CA) signs shall be removed promptly when no longer applicable.

Support:

The C17(CA) sign is authorized for use by CVC Section 22362. This section provides authority to post a speed limit of not less than 40 km/h (25 mph) at locations where employees of any contractor, or of the agency in charge of the job, are engaged in work upon the roadway.

Posting unrealistically low speed limits will result in loss of sign credibility and a high violation rate.

Guidance:

Before using a C17(CA) sign, work zone conditions should be analyzed to determine what maximum speed limit would be appropriate for that particular location.

The C17(CA) sign should be placed within 120 m (400 ft) of the zone where workers are on the roadway or so nearly adjacent as to be endangered by traffic.

Option:

The C17(CA) sign may be provided by the agency having jurisdiction over the street or road.

Section 6F.105(CA) OPEN TRENCH Sign (C27(CA))

Standard:

The OPEN TRENCH (C27(CA)) sign shall be used in advance of open trenches in/or adjacent to roadway.

The edge of the traveled way shall be defined by edge line delineation consisting of appropriate markers or striping. Edge line delineation shall be white when located on the right of traffic and yellow when located on the left of traffic.

Support:

The 900 x 900 mm (36 x 36 in) size is for conventional state highways and the 1200 x 1200 mm (48 x 48 in) size is for use on freeways and expressways.

Guidance:

Trenches in excess of 46 mm (0.15 ft) in depth but not exceeding 76 mm (0.25 ft) in depth that are less than 2.4 m (8 ft) from the edge of traveled way should be identified by LOW SHOULDER (W8-9) portable signs on Type II barricades set in the trench adjacent to the edge of pavement at intervals not to exceed 610 m (2,000 ft).

Option:

Portable delineators may be placed at intervals not to exceed 30 m (100 ft) in lieu of edge line delineation.

Standard:

Trenches in excess of 76 mm (0.25 ft) in depth that are less than 2.4 m (8 ft) from the edge of traveled way shall be identified by C27(CA) and NO SHOULDER (C31A(CA)) portable signs on Type II or Type III barricades alternately set in the trench at intervals not to exceed 610 m (2,000 ft).

Guidance:

Channelizers or delineators should be placed 0.6 m (2 ft) to 1.8 m (6 ft) outside of the edge line at 30 m (100 ft) intervals.

Trenches in excess of 76 mm (0.25 ft) in depth but not exceeding 762 mm (2.5 ft) in depth that are 2.4 m (8 ft) to 4.6 m (15 ft) from the edge of traveled way should be identified by C27(CA) portable signs on Type II or Type III barricades set in the trench at intervals not to exceed 610 m (2,000 ft). Delineators should be placed at 60 m (200 ft) intervals within 0.6 m (2 ft) from the edge of the trench and at 30 m (100 ft) intervals for edge conditions exceeding 152 mm (0.5 ft) in depth.

Trenches in excess of 152 mm (0.5 ft) in depth but not exceeding 762 mm (2.5 ft) in depth that are more than 4.6 m (15 ft) from the edge of traveled way at locations where a recovery area was available prior to construction should be identified by placing delineators at 60 m (200 ft) intervals within 0.6 m (2 ft) from the edge of the trench and by placing C27(CA) signs in the trench at intervals not to exceed 610 m (2,000 ft).

Standard:

Signing for trenches in excess of 762 mm (2.5 ft) in depth shall be based upon engineering judgment or studies (as noted in Section 1A.09) to ensure proper visibility of barricades and signing.

Section 6F.106(CA) Traffic Fines Signs (C40(CA) and C40A(CA))

Option:

The TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES (C40(CA)) and TRAFFIC FINES DOUBLED IN WORK ZONES (C40A(CA)) signs may be placed approximately 150 m (500 ft) in advance of the first required TTC sign(s). The placement of the C40(CA) and C40A(CA) signs is at the discretion of the responsible person(s) in charge of the work zone.

Guidance:

The C40A(CA) sign is intended to be manufactured as a fabric sign and should be used on a short term (daily) basis only. Longer term situations should use the C40(CA) sign.

Section 6F.107(CA) Moving Lane Closure Signs (W23-1 and SC10(CA), SC11(CA), SC13(CA), SC15(CA))

Standard:

On State highways, the following signs shall be used as shown in the Department of Transportation's Standard Plans T15, T16 and T17 for moving lane closures. See Section 1A.11 for information regarding this publication.

LANE CLOSED AHEAD or ROAD WORK AHEAD (SC10(CA)).
LANE CLOSED (SC11(CA)).
SLOW TRAFFIC AHEAD (W23-1).
DO NOT PASS (SC13(CA)).
CAUTION (SC15(CA)).

The Moving Lane Closure signs shall have a black legend on either a white or an orange background.

If used, the SC10(CA) sign and a Type II flashing arrow sign shall be mounted on the rear of the designated sign vehicle.

The SC11(CA) sign and a Type II flashing arrow sign shall be mounted on the rear of the designated sign vehicle.

If used, the W23-1 sign shall be mounted on the rear of the designated sign vehicle.

The SC13(CA) sign shall be mounted on the rear and/or the front of the designated sign vehicle.

If used, the SC15(CA) sign shall be mounted on the front of the designated sign vehicle.

Section 6F.108(CA) Object Markers

Standard:

When used in work zones, the Type N-3(CA) or OM1-3 object markers shall have an orange retroreflective background.

When used in work zones, the Type P(CA), R(CA), OM-3L, OM-3R and OM-3C object marker shall have alternating retroreflective orange and white stripes.

Support:

Figure 6F-103(CA) shows examples of object markers in TTC zones.

See Chapter 3C for more details.

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Figure 6F-1. Height and Lateral Location of Signs—Typical Installations

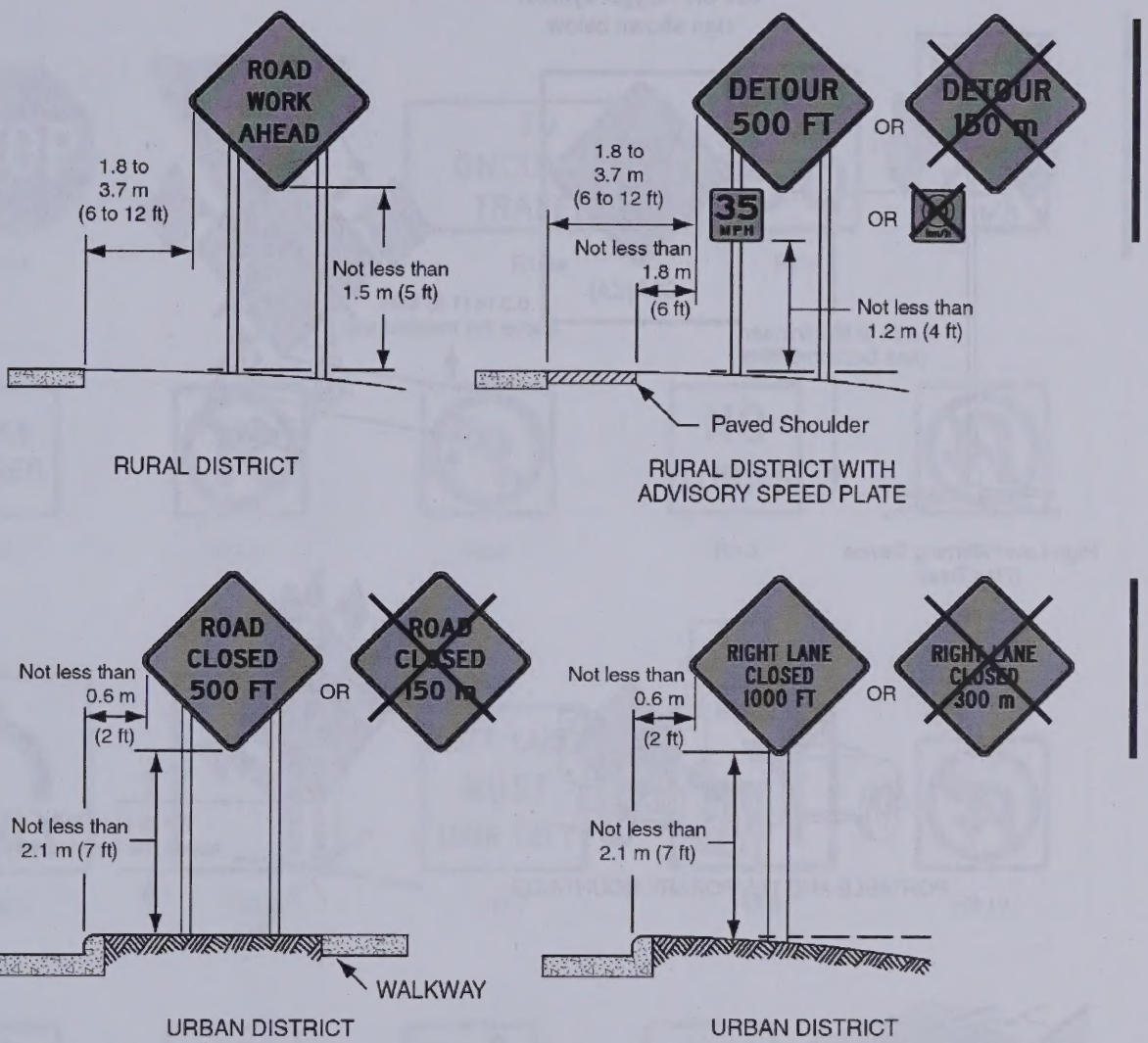
ROAD WORK AHEAD
1.8 to 3.7 m (6 to 12 ft)
Not less than 1.5 m (5 ft)
RURAL DISTRICT
DETOUR 500 FT
OR
DETOUR 150 m
OR
1.8 to 3.7 m (6 to 12 ft)
35 MPH
Not less than 1.8 m (6 ft)
Not less than 1.2 m (4 ft)
Paved Shoulder
RURAL DISTRICT WITH ADVISORY SPEED PLATE
ROAD CLOSED 500 FT
OR
ROAD CLOSED 150 m
Not less than 0.6 m (2 ft)
Not less than 2.1 m (7 ft)
WALKWAY
URBAN DISTRICT
RIGHT LANE CLOSED 1000 FT
OR
RIGHT LANE CLOSED 300 m
Not less than 0.6 m (2 ft)
Not less than 2.1 m (7 ft)
URBAN DISTRICT

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Figure 6F-2. Methods of Mounting Signs Other Than on Posts

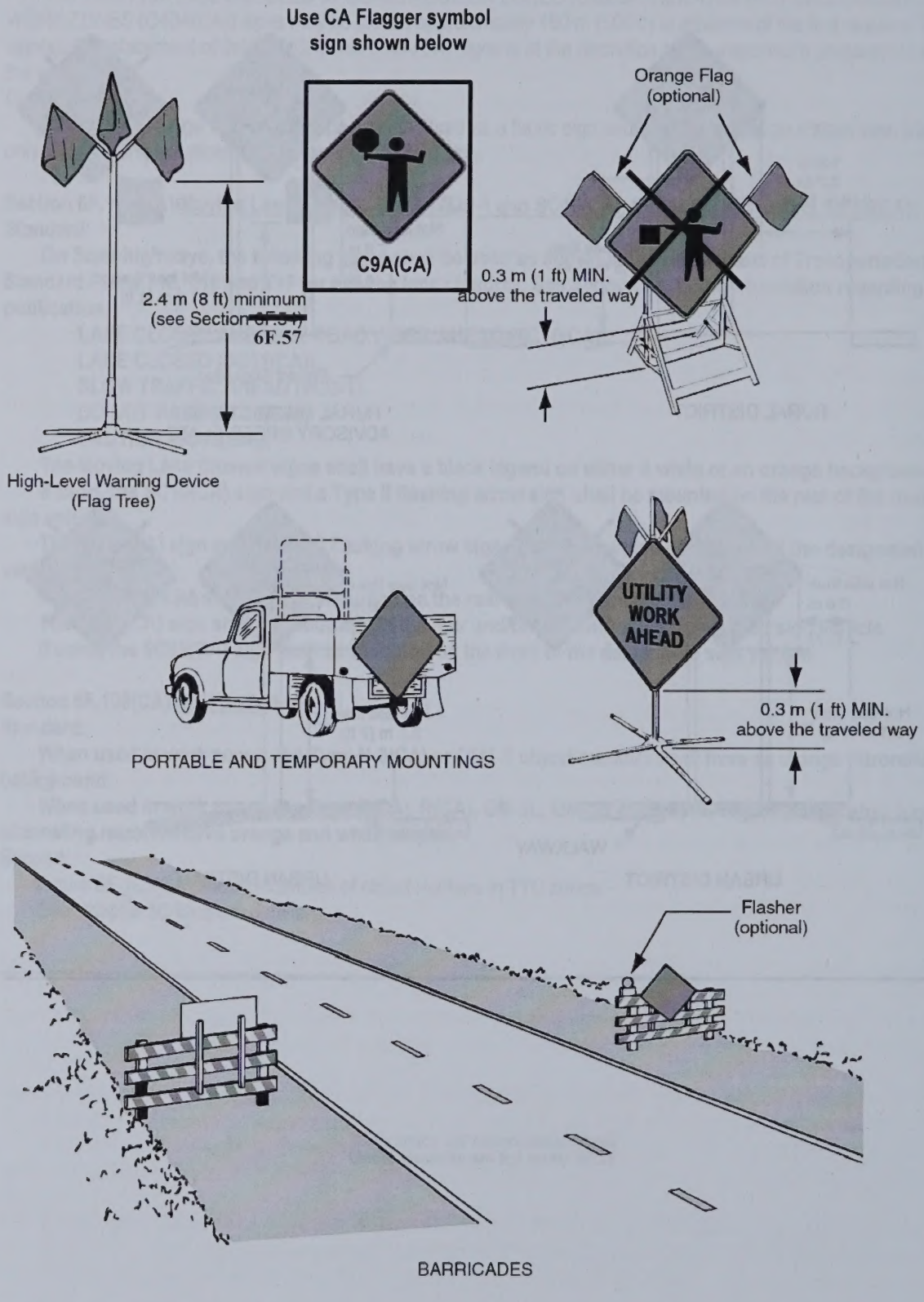
Use CA Flagger symbol sign shown below
C9A(CA)
Orange Flag (optional)
0.3 m (1 ft) MIN. above the traveled way
2.4 m (8 ft) minimum (see Section 6F.57)
High-Level Warning Device (Flag Tree)
PORTABLE AND TEMPORARY MOUNTINGS
UTILITY WORK AHEAD
0.3 m (1 ft) MIN. above the traveled way
Flasher (optional)
BARRICADES

Figure 6F-3. Regulatory Signs in Temporary Traffic Control Zones
(Sheet 1 of 2)

Figure 6F-3. Regulatory Signs in Temporary Traffic Control Zones
(Sheet 2 of 2)

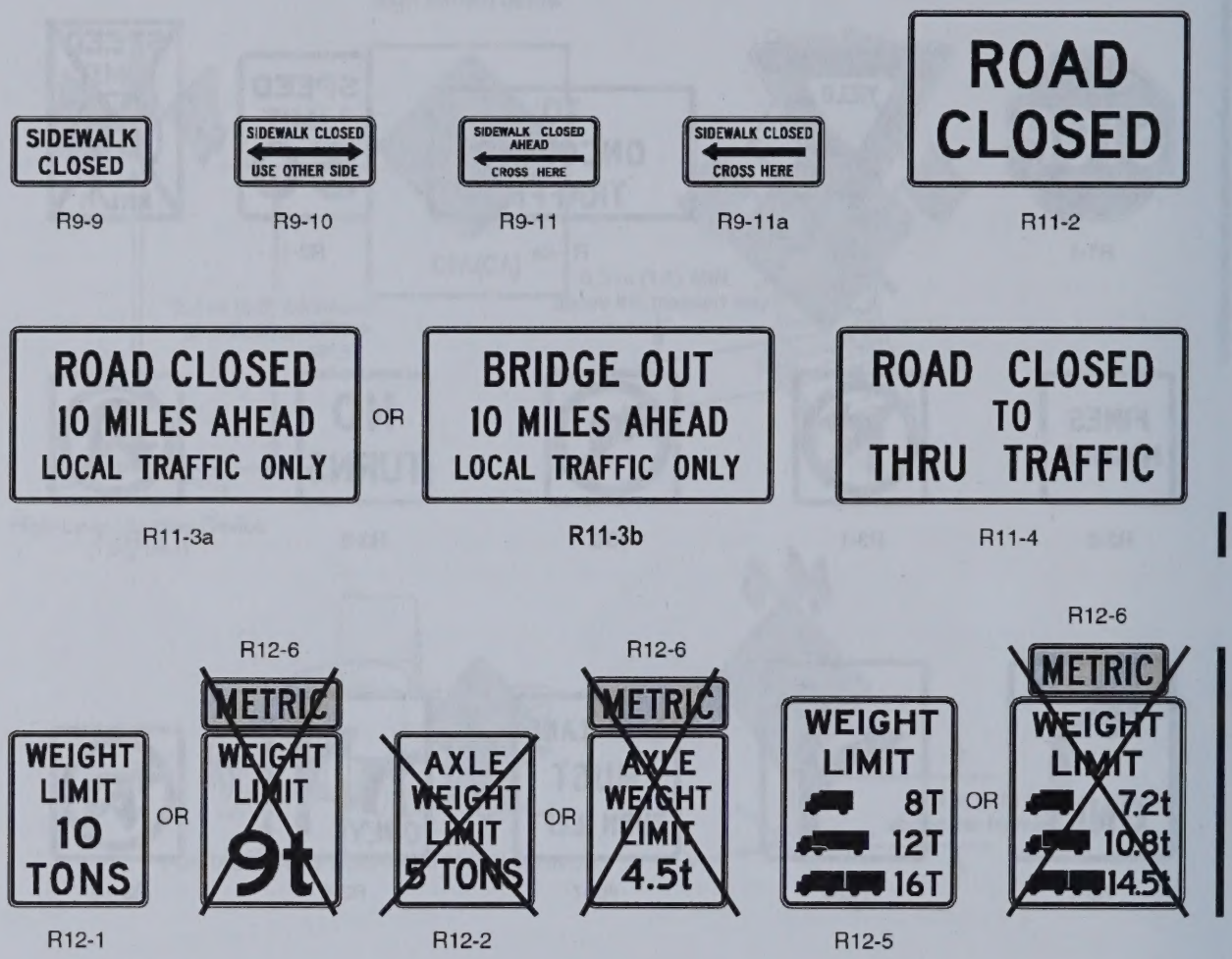

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Figure 6F-4. Warning Signs in Temporary Traffic Control Zones
(Sheet 1 of 4)

Figure 6F-4. Warning Signs in Temporary Traffic Control Zones
(Sheet 2 of 4)

W6-3 W6-4 W7-1 W8-1 W8-2 W8-3

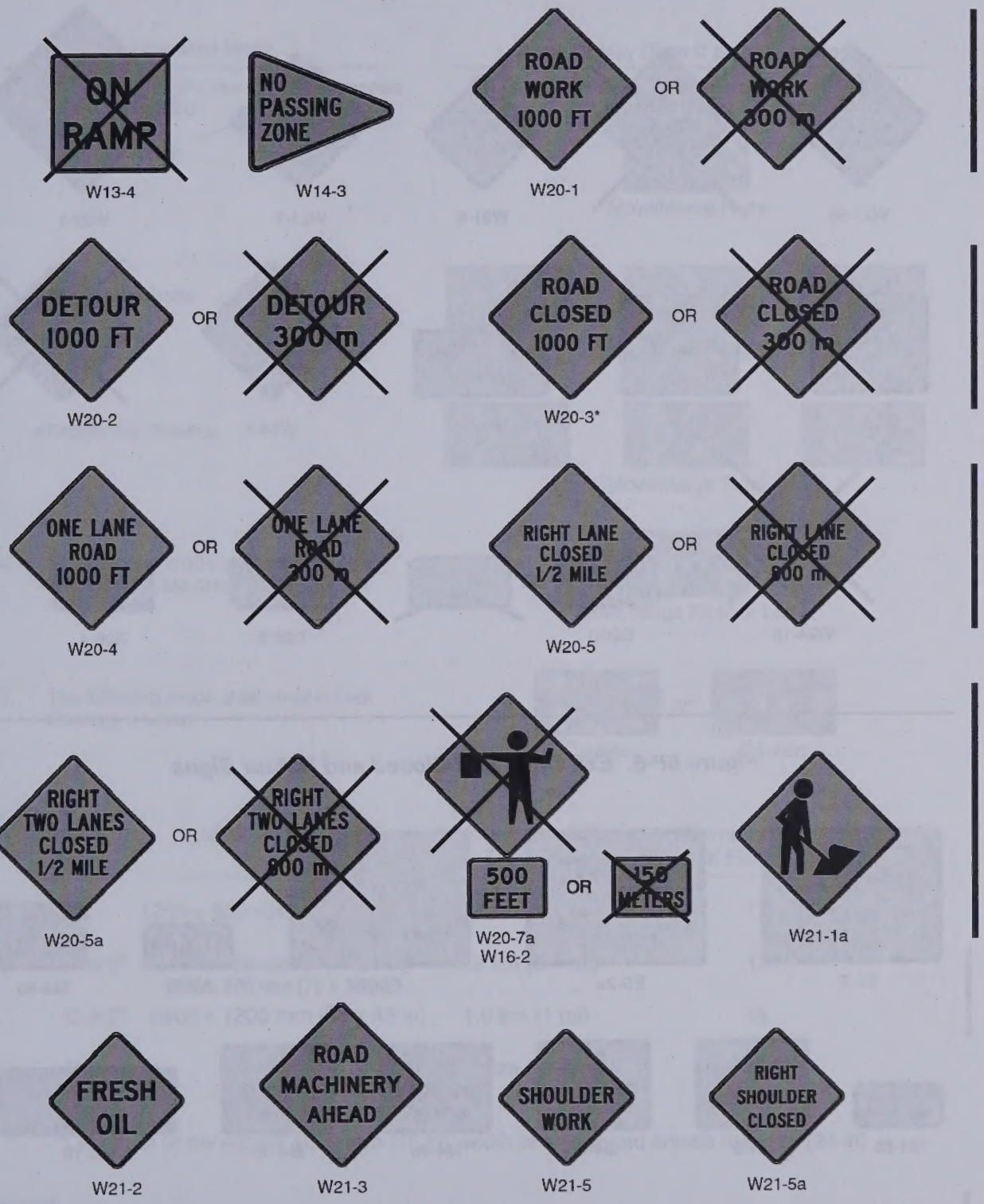
W8-4 W8-5 W8-6 W8-7 W8-8

W8-9 W8-9a W8-11 W8-12 W9-1

W9-2 W9-3 W9-3a W10-1 W11-10

W12-1 W12-2 W13-1

Figure 6F-4. Warning Signs in Temporary Traffic Control Zones
(Sheet 3 of 4)



* An optional STREET CLOSED word message sign is shown in the "Standard Highway Signs" book.

Figure 6F-4. Warning Signs in Temporary Traffic Control Zones
(Sheet 4 of 4)

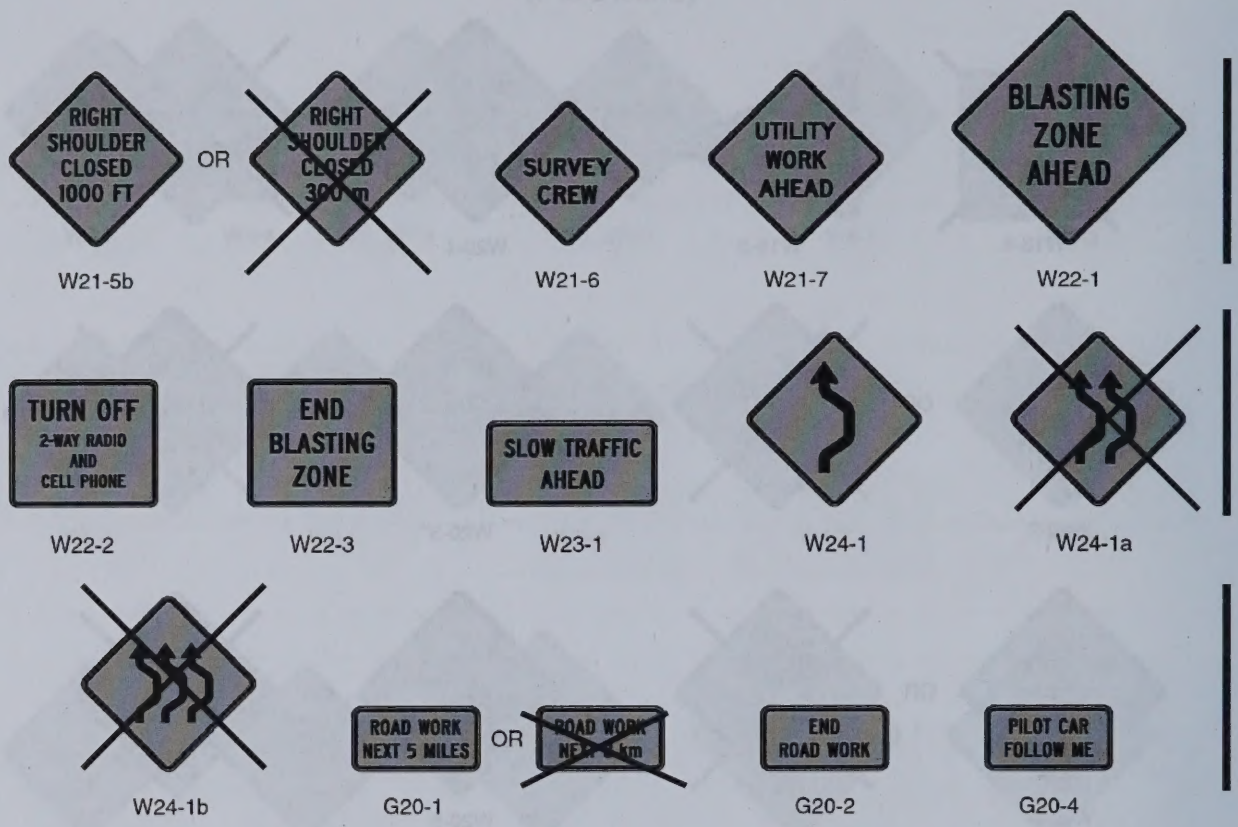


Figure 6F-5. Exit Open and Closed and Detour Signs

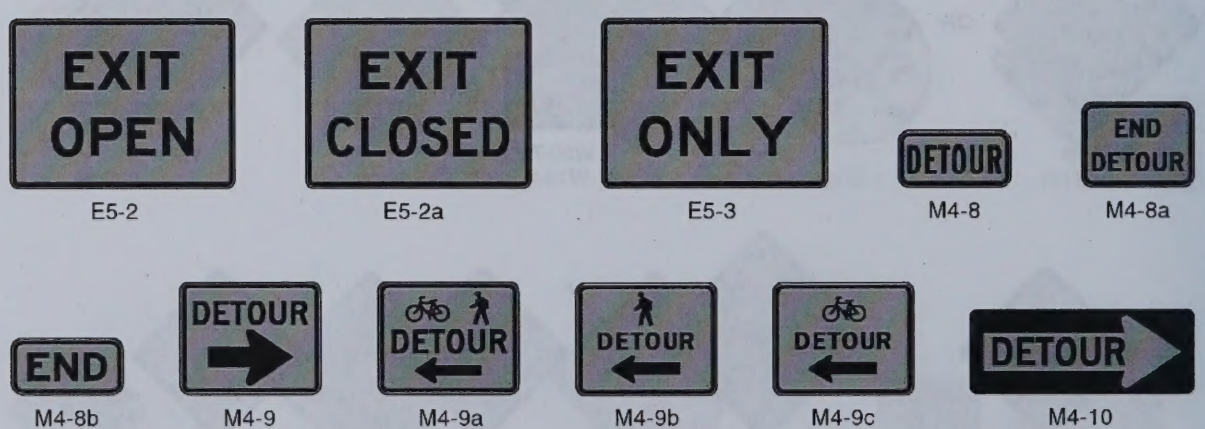


Figure 6F-6. Advance Warning Arrow Display Specifications

Operating Mode	Panel Display (Type C panel illustrated)
I. At least one of the three following modes shall be provided:	(Right arrow shown; left is similar)
Flashing Arrow	Move/Merge Right
Sequential Arrow	Move/Merge Right
Sequential Chevron	Move/Merge Right
II. The following mode shall be provided: Flashing Double Arrow	Move/Merge Right or Left
III. The following mode shall be provided: Flashing Caution	Caution or Caution

Panel Type	Minimum Size	Minimum Legibility Distance	Minimum Number of Elements
A	1200 x 600 mm (48 x 24 in)	0.8 km (1/2 mi)	12
B or II**	~~1500 x 750 mm (60 x 30 in)~~ **1800 x 900 mm (72 x 36 in)**	1.2 km (3/4 mi)	13
C or I**	2400 x 1200 mm (96 x 48 in)	1.6 km (1 mi)	15
D	None*	0.8 km (1/2 mi)	12

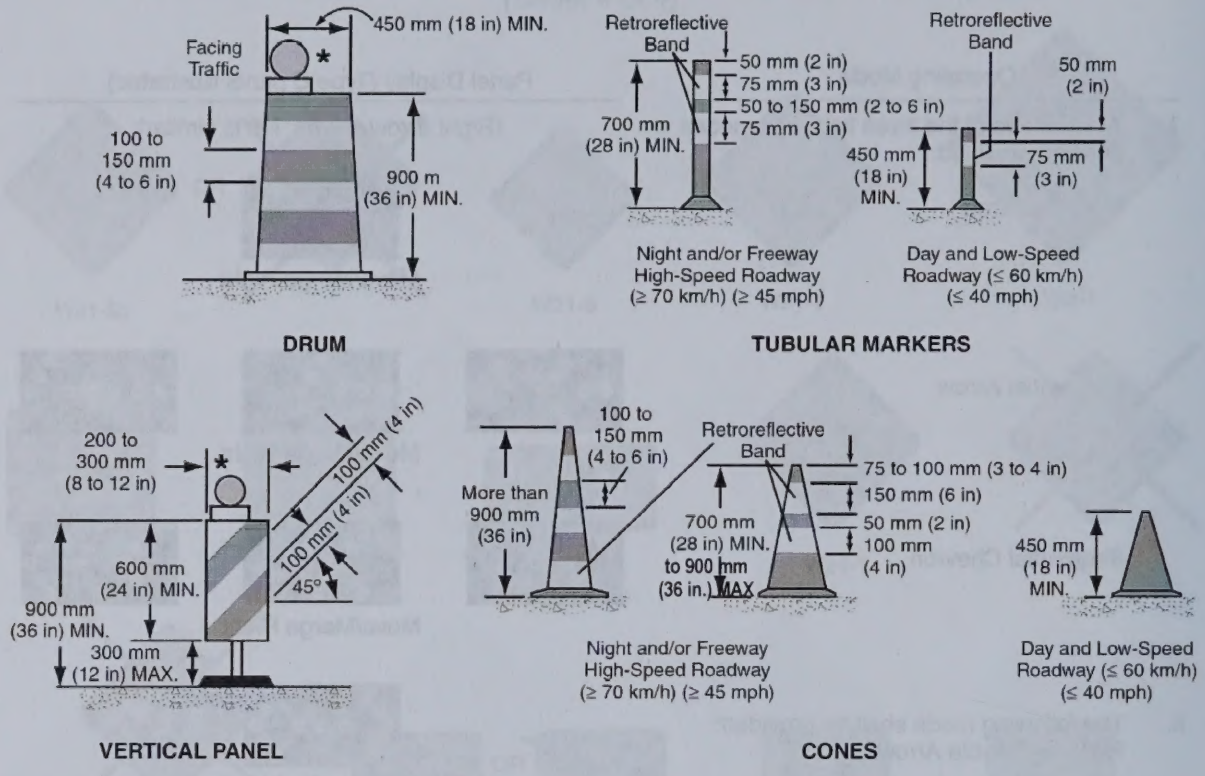
*Length of arrow equals 1200 mm (48 in), width of arrowhead equals 600 mm (24 in)

Standard:

*** - For State highways, the panel type B shall mean type II and the panel type C shall mean type I.**

*** - For State highways, the panel type B (or type II) shall have a minimum size of 1800 x 900 mm (72 x 36 in).**

Figure 6F-7. Channelizing Devices (Sheet 1 of 2)


450 mm (18 in) MIN.
Facing Traffic
*
100 to 150 mm (4 to 6 in)
900 m (36 in) MIN.
DRUM
Retroreflective Band
50 mm (2 in)
75 mm (3 in)
50 to 150 mm (2 to 6 in)
75 mm (3 in)
700 mm (28 in) MIN.
Night and/or Freeway High-Speed Roadway (≥ 70 km/h) (≥ 45 mph)
Retroreflective Band
50 mm (2 in)
450 mm (18 in) MIN.
75 mm (3 in)
Day and Low-Speed Roadway (≤ 60 km/h) (≤ 40 mph)
TUBULAR MARKERS
200 to 300 mm (8 to 12 in)
*
100 mm (4 in)
100 mm (4 in)
600 mm (24 in) MIN.
45°
900 mm (36 in) MIN.
300 mm (12 in) MAX.
VERTICAL PANEL
100 to 150 mm (4 to 6 in)
More than 900 mm (36 in)
Retroreflective Band
75 to 100 mm (3 to 4 in)
150 mm (6 in)
50 mm (2 in)
100 mm (4 in)
700 mm (28 in) MIN.
to 900 mm (36 in.) MAX
Night and/or Freeway High-Speed Roadway (≥ 70 km/h) (≥ 45 mph)
450 mm (18 in) MIN.
Day and Low-Speed Roadway (≤ 60 km/h) (≤ 40 mph)
CONES

* Warning lights (optional)

Note: If drums, cones, or tubular markers are used to channelize pedestrians, they shall be located such that there are no gaps between the bases of the devices, in order to create a continuous bottom, and the height of each individual drum, cone, or tubular marker shall be no less than 900 mm (36 in) to be detectable to users of long canes.

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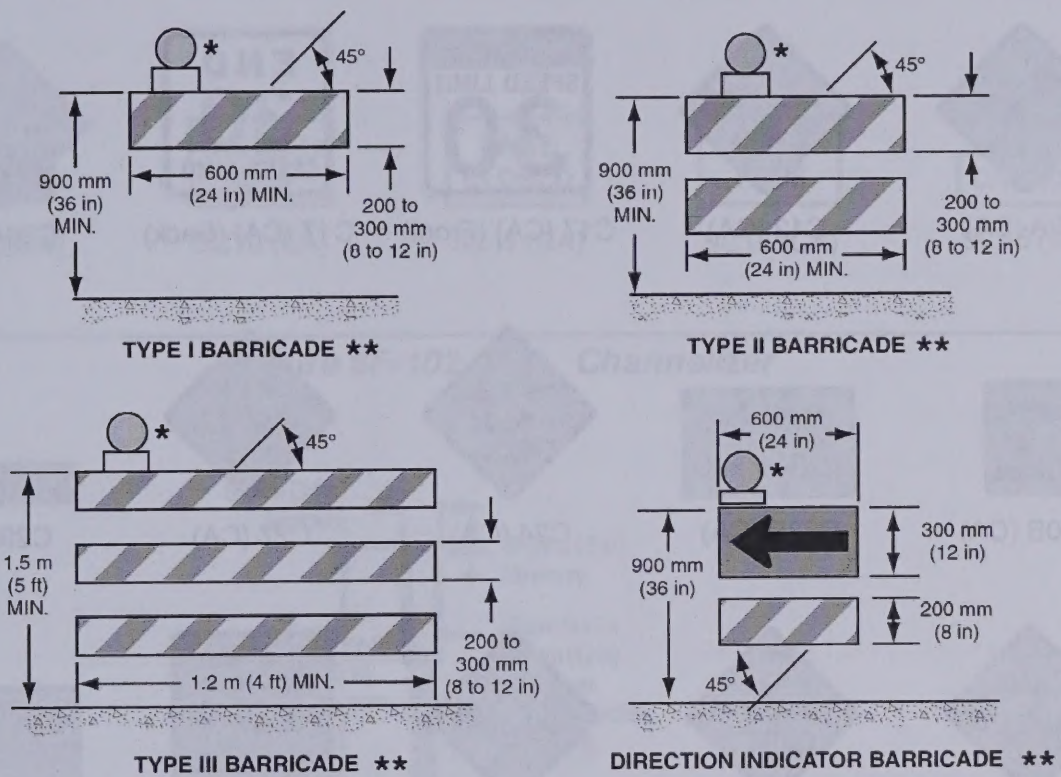
Figure 6F-7. Channelizing Devices (Sheet 2 of 2)



* Warning lights (optional)
** Rail stripe widths shall be 150 mm (6 in), except that 100 mm (4 in) wide stripes may be used if rail lengths are less than 900 mm (36 in). The sides of barricades facing traffic shall have retroreflective rail faces.

Note: If barricades are used to channelize pedestrians, there shall be continuous detectable bottom and top rails with no gaps between individual barricades to be detectable to users of long canes. The bottom of the bottom rail shall be no higher than 150 mm (6 in) above the ground surface. The top of the top rail shall be no lower than 900 mm (36 in) above the ground surface.

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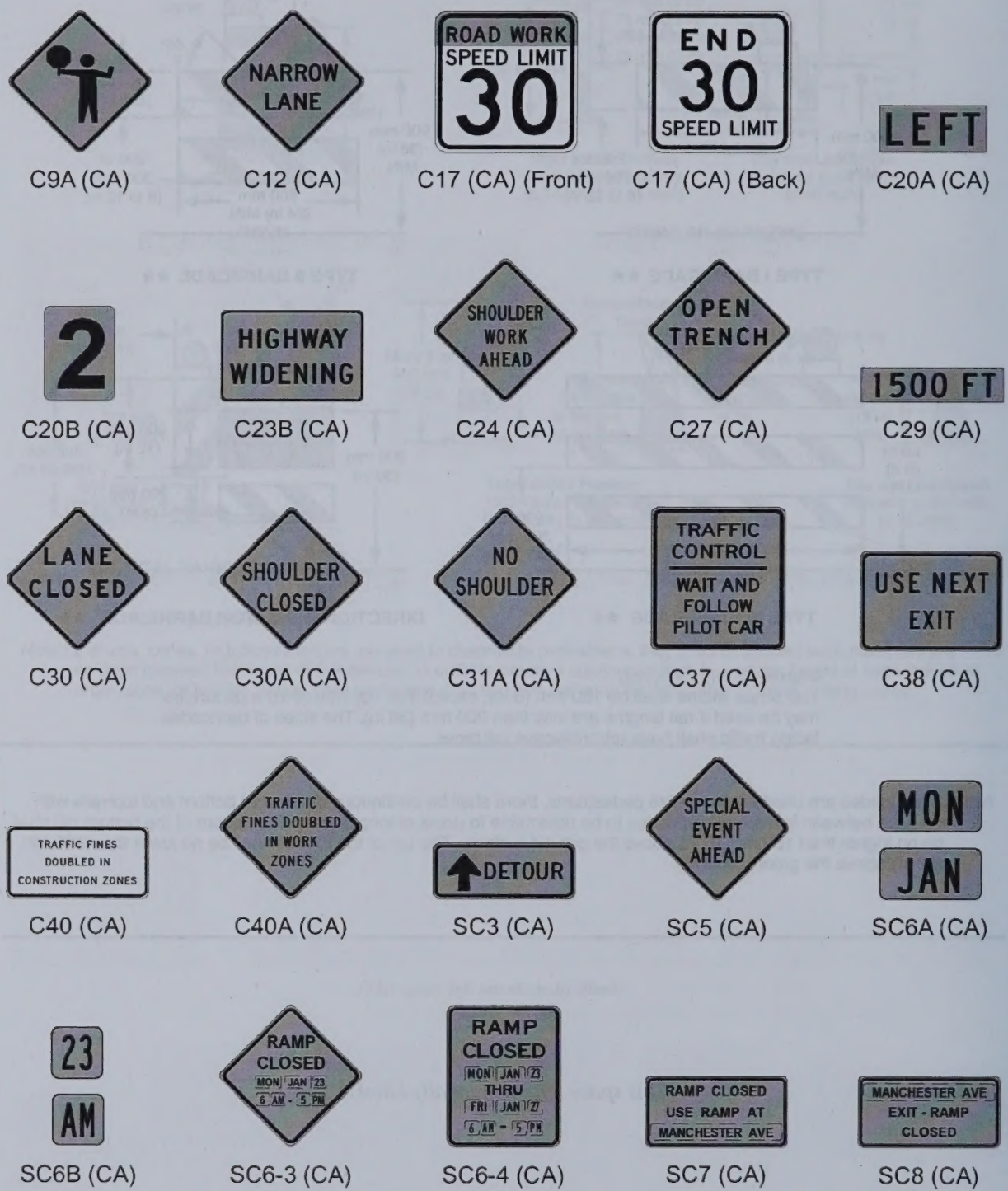
Figure 6F-101 (CA). California Temporary Traffic Control Signs
(Sheet 1 of 2)



C9A (CA) C12 (CA) C17 (CA) (Front) C17 (CA) (Back) C20A (CA)

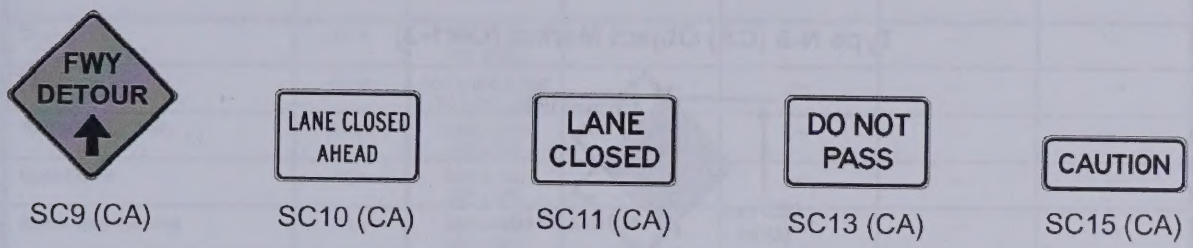
C20B (CA) C23B (CA) C24 (CA) C27 (CA) C29 (CA)

C30 (CA) C30A (CA) C31A (CA) C37 (CA) C38 (CA)

C40 (CA) C40A (CA) SC3 (CA) SC5 (CA) SC6A (CA)

SC6B (CA) SC6-3 (CA) SC6-4 (CA) SC7 (CA) SC8 (CA)

Figure 6F-101 (CA). California Temporary Traffic Control Signs (Sheet 2 of 2)



SC9 (CA) SC10 (CA) SC11 (CA) SC13 (CA) SC15 (CA)

Figure 6F-102 (CA). Channelizer

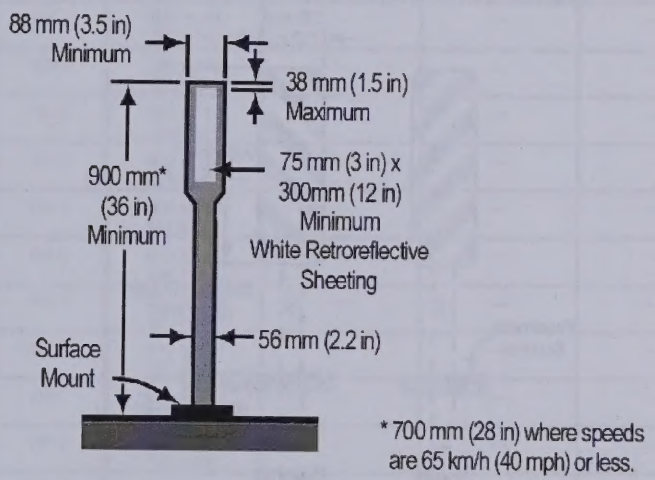


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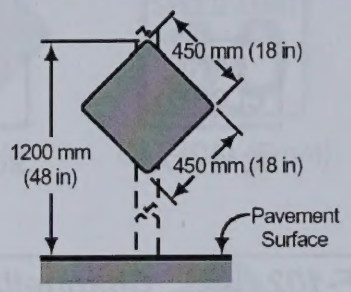
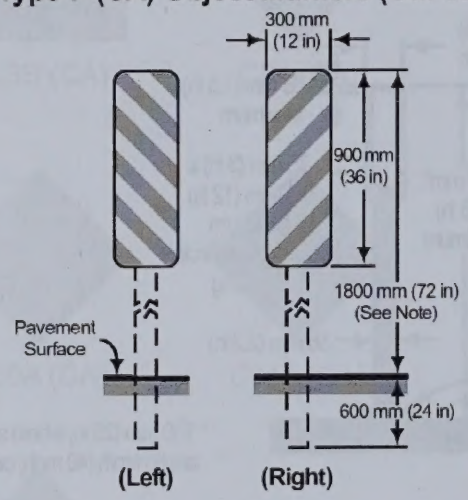
Figure 6F-103 (CA). Examples of Object Markers in Temporary Traffic Control Zones

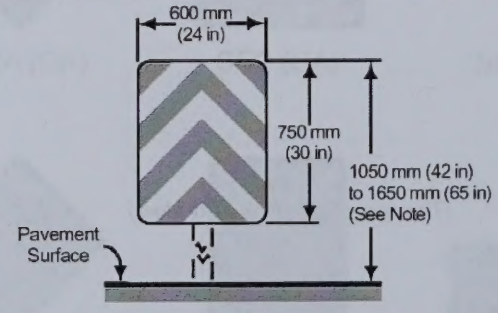
Type N-3 (CA) Object Marker (OM1-3)



Type P (CA) Object Markers (OM-3L&R)



Type R (CA) Object Marker (OM-3C)



Note:
The bottom of the marker is normally mounted 0.3 m (1 ft) above the pavement surface.

Table 6F-1. Sizes of Temporary Control Signs (Sheet 1 of 4)

Sign	MUTCD Code	Conventional Road	Expressway	Freeway	Minimum	Oversized
Stop	R1-1	750 x 750 (30 x 30)	—	—	—	—
Yield	R1-2	900 x 900 x 900 (36 x 36 x 36)	—	—	—	—
To Oncoming Traffic	R1-2a	1200 x 600 (48 x 24)	—	—	—	—
Speed Limit	R2-1	600 x 750 (24 x 30)	—	—	—	—
~~Speed Limit (metric)~~	~~R2-1~~	~~600 x 900 (24 x 36)~~	—	—	—	—
Fines Higher	R2-6	600 x 600 (24 x 24)	—	—	—	—
Turn Prohibition	R3-1,2,3, 4,18	600 x 600 (24 x 24)	—	—	—	—
Mandatory Movement (1 lane)	R3-5	750 x 900 (30 x 36)	—	—	—	—
Optional Movement (1 lane)	R3-6	750 x 900 (30 x 36)	—	—	—	—
Mandatory Movement (text)	R3-7	750 x 750 (30 x 30)	—	—	—	—
Lane Use (2 lanes)	R3-8	750 x 750 (30 x 30)	—	—	—	—
Do Not Pass	R4-1	600 x 750 (24 x 30)	—	—	—	—
Pass With Care	R4-2	600 x 750 (24 x 30)	—	—	—	—
Keep Right	R4-7	600 x 750 (24 x 30)	—	—	—	—
Stay in Lane	R4-9	600 x 750 (24 x 30)	—	—	—	—
Do Not Enter	R5-1	750 x 750 (30 x 30)	—	—	—	—
Wrong Way	R5-1a	900 x 600 (36 x 24)	—	—	—	—
One Way (inside arrow)	R6-1	900 x 300 (36 x 12)	—	—	—	—
One Way (with arrow)	R6-2	450 x 600 (18 x 24)	—	—	—	—
No Parking (symbol)	R8-3a	600 x 600 (24 x 24)	—	—	—	—
Pedestrian Crosswalk	R9-8	900 x 450 (36 x 18)	—	—	—	—
Sidewalk Closed	R9-9	600 x 300 (24 x 12)	—	—	—	—
Sidewalk Closed, Use Other Side	R9-10	600 x 300 (24 x 12)	—	—	—	—
Sidewalk Closed Ahead, Cross Here	R9-11	600 x 300 (24 x 12)	—	—	—	—
Sidewalk Closed, Cross Here	R9-11a	600 x 300 (24 x 12)	—	—	—	—
Road Closed	R11-2	1200 x 750 (48 x 30)	—	**(Also see C2(CA) Sign Size)**		—
Road Closed - Local Traffic Only	R11-3a,4	1500 x 750 (60 X 30)	—	—	—	—
Weight Limit	R12-1,~~2~~	600 x 750 (24 x 30)	—	—	—	—
Weight Limit (with symbols)	R12-5	750 x ~~900~~ 1050 (30 x ~~36~~) 42	—	—	—	—
Turn and Curve Signs	W1-1,2,3,4	750 x 750 (30 x 30)	—	—	—	—
~~Reverse Curve (2 or more lanes)~~	~~W1-4b,4c~~	~~900 x 900 (36 x 36)~~	—	**(See W1-4 Sign Size)**		—

Table 6F-1. Sizes of Temporary Control Signs (Sheet 2 of 4)

Sign	MUTCD Code	Conventional Road	Expressway	Freeway	Minimum	Oversized
One-Direction Large Arrow	W1-6	1200 x 600 (48 x 24)	—	—	—	—
Chevron	W1-8	900 x 1200 (36 x 48)	—	—	—	—
Stop Ahead (symbol)	W3-1	900 x 900 (36 x 36)	—	—	—	—
Yield Ahead (symbol)	W3-2	900 x 900 (36 x 36)	—	—	—	—
Signal Ahead (symbol)	W3-3	900 x 900 (36 x 36)	—	—	—	—
Be Prepared to Stop	W3-4	900 x 900 (36 x 36)	—	—	—	—
Speed Limit XX Ahead (symbol)	W3-5	900 x 900 (36 x 36)	—	—	—	—
Reduced Speed Zone Ahead	W3-5a	900 x 900 (36 x 36)	—	—	—	—
Merging Traffic	W4-1,5	900 x 900 (36 x 36)	—	—	—	—
Lane Ends (symbol)	W4-2	900 x 900 (36 x 36)	—	—	—	—
Added Lane	W4-3,6	900 x 900 (36 x 36)	—	—	—	—
Thru Traffic Merge Left	W4-7	900 x 900 (36 x 36)	—	—	—	—
Road Narrows	W5-1	900 x 900 (36 x 36)	—	—	—	—
Narrow Bridge	W5-2	900 x 900 (36 x 36)	—	—	—	—
One Lane Bridge	W5-3	900 x 900 (36 x 36)	—	—	—	—
~~Ramp Narrows~~	~~W5-4~~	~~900 x 900 (36 x 36)~~	—	(See W5-1 or C12(CA) Sign Sizes)		—
Divided Highway (symbol)	W6-1	900 x 900 (36 x 36)	—	—	—	—
Divided Highway Ends (symbol)	W6-2	900 x 900 (36 x 36)	—	—	—	—
Two-Way Traffic	W6-3	750 x 750 (30 x 30)	—	—	—	—
Two-Way Traffic (plaque)	W6-4	300 x 450 (12 x 18)	—	—	—	—
Hill (symbol)	W7-1	750 x 750 (30 x 30)	—	—	—	—
Bump	W8-1	750 x 750 (30 x 30)	—	—	—	—
Dip	W8-2	750 x 750 (30 x 30)	—	—	—	—
Pavement Ends	W8-3	750 x 750 (30 x 30)	—	—	—	—
Soft Shoulder	W8-4	750 x 750 (30 x 30)	—	—	—	—
Slippery When Wet (symbol)	W8-5	750 x 750 (30 x 30)	—	—	—	—
Truck Crossing	W8-6	750 x 750 (30 x 30)	—	—	—	—
Loose Gravel	W8-7	750 x 750 (30 x 30)	—	—	—	—
Rough Road	W8-8	750 x 750 (30 x 30)	—	—	—	—
Low Shoulder	W8-9	750 x 750 (30 x 30)	—	—	—	—
Shoulder Drop-Off	W8-9a	750 x 750 (30 x 30)	—	—	—	—

Table 6F-1. Sizes of Temporary Control Signs (Sheet 3 of 4)

Sign	MUTCD Code	Conventional Road	Expressway	Freeway	Minimum	Oversized
Uneven Lanes	W8-11	900 x 900 (36 x 36)	—	—	—	—
No Center Stripe	W8-12	900 x 900 (36 x 36)	—	—	—	—
Lane Ends	W9-1,2	900 x 900 (36 x 36)	—	—	—	—
Lane Closed Ahead	W9-3	900 x 900 (36 x 36)	—	—	—	—
Center Lane Closed Ahead (symbol)	W9-3a	900 x 900 (36 x 36)	—	—	—	—
Railroad Advance Warning (circular)	W10-1	900 dia. (36 dia.)	—	—	—	—
Truck (symbol)	W11-10	750 x 750 30 x 30	—	—	—	—
Two Arrow	W12-1	600 x 600 (24 x 24)	—	—	—	—
Low Clearance	W12-2	900 x 900 (36 x 36)	—	—	—	—
Advisory Speed (plaque)	W13-1	450 x 450 or 600 x 600 (18 x 18 or 24 x 24)	—	—	—	—
~~On Ramp (plaque)~~	~~W13-4~~	~~900 x 900 (36 x 36)~~	—	—	—	—
No Passing Zone (pennant)	W14-3	900 x 1200 x 1200 (36 x 48 x 48)	—	—	—	—
XX ~~Meters or~~ Feet (plaque)	W16-2	600 x 450 (24 x 18)	—	—	—	—
Road Work (with distance)	W20-1	900 x 900 (36 x 36)	—	(Also See C23(CA) Sign Size)		—
Detour (with distance)	W20-2	900 x 900 (36 x 36)	—	—	—	—
Road (Street) Closed (with distance)	W20-3	900 x 900 (36 x 36)	—	(Also See C19(CA) Sign Size)		—
One Lane Road (with distance)	W20-4	900 x 900 (36 x 36)	—	—	—	—
Lane(s) Closed (with distance)	W20-5,5a	900 x 900 (36 x 36)	—	(Also See C20(CA) Sign Size)		—
~~Flagger (symbol)~~	~~W20-7a~~	~~900 x 900 (36 x 36)~~	—	(See ~~G9A(CA)~~ Sign ~~Size~~)		—
Workers	W21-1	900 x 900 (36 x 36)	—	—	—	—
Workers (symbol)	W21-1a	900 x 900 (36 x 36)	—	—	—	—
Fresh Oil	W21-2	750 x 750 (30 x 30)	—	—	—	—
Road Machinery Ahead	W21-3	900 x 900 (36 x 36)	—	—	—	—
Shoulder Work	W21-5	750 x 750 (30 x 30)	—	—	—	—
Shoulder Closed	W21-5a	750 x 750 (30 x 30)	—	—	—	—
Shoulder Closed (with distance)	W21-5b	900 x 900 (36 x 36)	—	—	—	—
Survey Crew	W21-6	750 x 750 (30 x 30)	—	—	—	—
Utility Work Ahead	W21-7	900 x 900 (36 x 36)	—	—	—	—
Blasting Zone Ahead	W22-1	1200 x 1200 (48 x 48)	—	—	—	—
Turn Off 2-Way Radio and Cell Phone	W22-2	1050 x 900 (42 x 36)	—	—	—	—
End Blasting Zone	W22-3	1050 x 900 (42 x 36)	—	—	—	—

Table 6F-1. Sizes of Temporary Control Signs (Sheet 4 of 4)

Sign	MUTCD Code	Conventional Road	Expressway	Freeway	Minimum	Oversized
Slow Traffic Ahead	W23-1	1200 x 600 (48 x 24)	—	(Also See SC12(CA) Sign Size)		—
Double Reverse Curve (1 lane)	W24-1	900 x 900 (36 x 36)	—	—	—	—
~~Double Reverse Curve (2 lanes)~~	~~W24-1a~~	~~900 x 900 (36 x 36)~~	—	(See W24-1 Sign Size)		—
~~Double Reverse Curve (3 lanes)~~	~~W24-1b~~	~~900 x 900 (36 x 36)~~	—	(See W24-1 Sign Size)		—
Road Work Next XX ~~km~~ or Miles	G20-1	900 x 450 (36 x 18)	—	(Also See C11(CA) Sign Size)		—
End Road Work	G20-2	900 x 450 (36 x 18)	—	(Also See C14(CA) Sign Size)		—
Pilot Car Follow Me	G20-4	900 x 450 (36 x 18)	—	—	—	—
Exit Open	E5-2	1200 x 900 (48 x 36)	—	—	—	—
Exit Closed	E5-2a	1200 x 900 (48 x 36)	—	—	—	—
Exit Only	E5-3	1200 x 900 (48 x 36)	—	—	—	—
Detour (plaque)	M4-8	600 x 300 (24 x 12)	—	—	—	—
End Detour	M4-8a	600 x 450 (24 x 18)	—	—	—	—
End (plaque)	M4-8b	600 x 300 (24 x 12)	—	—	—	—
Detour (with arrow)	M4-9	750 x 600 (30 x 24)	—	—	—	—
Bike/Pedestrian Detour (with arrow)	M4-9a	750 x 600 (30 x 24)	—	—	—	—
Pedestrian Detour (with arrow)	M4-9b	750 x 600 (30 x 24)	—	—	—	—
Bike Detour (with arrow)	M4-9c	750 x 600 (30 x 24)	—	—	—	—
Detour (inside arrow)	M4-10	1200 x 450 (48 x 18)	—	—	—	—

Notes:
1. Larger signs may be used wherever necessary for greater legibility or emphasis.
2. Dimensions are shown in millimeters followed by inches in parentheses and are shown as width x height.
3. For freeways and expressways, the size of diamond shaped TTC warning signs shall be a minimum of 1200 x 1200 mm (48 x 48 in).

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Table 6F-1(CA). Sizes of California Temporary Traffic Control Signs

Sign (MUTCD Code, if any)	California Code	Conventional Road	Expressway	Freeway	Minimum	Oversized
Flagger Symbol	C9A(CA)	36 x 36	48 x 48	48 x 48	---	---
NARROW LANE(S)	C12(CA)	36 x 36	48 x 48	48 x 48	---	---
Road Work/Speed Limit	C17(CA)	24 x 24	24 x 24	24 x 24	---	---
RIGHT LANE CLOSED AHEAD	C20(CA)	36 x 36	48 x 48	48 x 48	---	72 x 72
LEFT Plaque	C20A(CA)	16 x 7	19 x 8	19 x 8	---	33 x 10
Numeral Plaque	C20B(CA)	6 x 8	8 x 10	8 x 10	---	10 x 12
ROAD (STREET) WORK Informational Plaque	C23B(CA)	Var x 18	Var x 24	Var x 24	---	---
SHOULDER WORK AHEAD	C24(CA)	30 x 30	48 x 48	48 x 48	---	---
OPEN TRENCH	C27(CA)	36 x 36	48 x 48	48 x 48	---	---
XXXX FT	C29(CA)	20 x 7	36 x 9	36 x 9	---	---
LANE CLOSED	C30(CA)	30 x 30	48 x 48	48 x 48	---	---
SHOULDER CLOSED	C30A(CA)	30 x 30	48 x 48	48 x 48	---	---
NO SHOULDER	C31A(CA)	36 x 36	48 x 48	48 x 48	---	---
TRAFFIC CONTROL - WAIT AND FOLLOW PILOT CAR	C37(CA)	36 x 42	36 x 42	36 x 42	---	---
USE NEXT EXIT	C38(CA)	48 x 36	48 x 36	48 x 36	---	---
TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES	C40(CA)	108 x 42	144 x 60	144 x 60	---	---
TRAFFIC FINES DOUBLED IN WORK ZONES	C40A(CA)	36 x 36	48 x 48	48 x 48	---	---
DETOUR with Arrow	SC3(CA)	36 x 12	---	---	---	48 x 18
SPECIAL EVENT AHEAD	SC5(CA)	36 x 36	48 x 48	48 x 48	---	---
RAMP CLOSED (Not more than one day)	SC6-3(CA)	48 x 48	48 x 48	48 x 48	---	---
RAMP CLOSED (More than one day)	SC6-4(CA)	48 x 60	48 x 60	48 x 60	---	---
XXX month	SC6A(CA)	12 x 6	12 x 6	12 x 6	---	---
XX day	SC6B(CA)	6 x 6	6 x 6	6 x 6	---	---
RAMP CLOSED, USE RAMP AT ___	SC7(CA)	84 x 42	84 x 42	84 x 42	---	---
___ EXIT - RAMP CLOSED	SC8(CA)	84 x 42	84 x 42	84 x 42	---	---
FWY DETOUR with Arrow	SC9(CA)	36 x 36	---	---	---	---
LANE CLOSED AHEAD	SC10(CA)	48 x 30	66 x 36	66 x 36	---	---
LANE CLOSED	SC11(CA)	42 x 30	54 x 42	54 x 42	---	---
DO NOT PASS	SC13(CA)	42 x 30	54 x 42	54 x 42	---	---
CAUTION	SC15(CA)	42 x 18	54 x 24	54 x 24	---	---
RAMP CLOSED (R11-2)	~~C2(CA)~~	48 x 30	48 x 30	48 x 30	---	---
ROAD CONSTRUCTION NEXT XX MILES (G20-1)	~~C11(CA)~~	60 x 36	90 x 48	90 x 48	---	---
END ROAD WORK (G20-2)	~~C14(CA)~~	36 x 18	48 x 24	48 x 24	---	---
RAMP CLOSED AHEAD (W20-3)	~~C19(CA)~~	36 x 36	48 x 48	48 x 48	---	---
RAMP WORK AHEAD (W20-1)	~~C23(CA)~~	30 x 30	48 x 48	48 x 48	---	---
SLOW TRAFFIC AHEAD (W23-1)	~~SC12(CA)~~	54 x 30	72 x 42	72 x 42	---	---

Table 6F-101(CA). California Temporary Traffic Control Signs (Sheet 1 of 2)

California Code	MUTCD Code	Title of Sign	California MUTCD Section
~~C1(CA)~~	W20-2	DETOUR	6F.18
~~C2(CA)~~	R11-2	ROAD (STREET) CLOSED	6F.08, 6F.28, 6F.53, 2B.48
~~C3(CA)~~	R11-3a	ROAD CLOSED XX MILES AHEAD, LOCAL TRAFFIC ONLY	6F.09, 6F.53, 2B.48
~~C3A(CA)~~	R11-4	ROAD (STREET) CLOSED TO THRU TRAFFIC	6F.09, 6F.53, 2B.48
~~C4(CA)~~	W21-2	FRESH OIL (TAR)	6F.32
~~C5(CA)~~	M4-10	Detour Arrow	6F.03, 6F.53
~~C5A(CA)~~	M4-8	DETOUR	6F.53, 6G.10
~~C6(CA)~~	W8-7	LOOSE GRAVEL	6F.102(CA)
~~C7(CA)~~	M4-8a	END DETOUR	6F.53
~~C8(CA)~~	W21-3	ROAD MACHINERY AHEAD	6F.33
C9A(CA)	None	Flagger Symbol	6F.29
~~C11(CA)~~	G20-1	ROAD WORK NEXT XX MILES	6F.51
C12(CA)	None	NARROW LANE(S)	6F.26, 6F.103(CA)
~~C14(CA)~~	G20-2	END ROAD WORK	6F.52
~~C16(CA)~~	W20-4	ONE LANE ROAD	6F.20
C17(CA)	None	Road Work/Speed Limit	6F.104(CA)
~~C19(CA)~~	W20-3	ROAD (STREET) CLOSED	6F.19
C20(CA)	None	RIGHT LANE CLOSED AHEAD	6F.21
C20A(CA)	None	LEFT Plaque	6F.21
C20B(CA)	None	Numeral Plaque	6F.21
~~C22B(CA)~~	W21-1a	Workers	6F.31, 6G.06
~~C22C(CA)~~	W21-1	WORKERS	6F.31
~~C23(CA)~~	W20-1	ROAD (STREET) WORK	6F.17, 6F.27, 6F.37, 6F.72
C23B(CA)	None	ROAD (STREET) WORK Informational Plaque	6F.17
C24(CA)	None	SHOULDER WORK AHEAD	6F.35
~~C25(CA)~~	W21-6	SURVEY CREW	6F.36
~~C26(CA)~~	G20-4	PILOT CAR FOLLOW ME	6C.13, 6F.54
C27(CA)	None	OPEN TRENCH	6F.105(CA)
C28A(CA)	Not Assigned	STOP Paddle	6E.03, 6E.04, 7E.05, 7E.09
C28B(CA)	Not Assigned	SLOW Paddle	6E.03, 6E.04
C28C(CA)	None	Short and Long Handle (for STOP/SLOW Paddle) Details	6E.03, 7E.05
C29(CA)	None	XXX FT	6F.49
C30(CA)	None	LANE CLOSED	6F.21
C30A(CA)	None	SHOULDER CLOSED	6F.35
~~C30B(CA)~~	W21-5b	RIGHT (LEFT) SHOULDER CLOSED XXX FT	6F.35
~~C31(CA)~~	W8-9	LOW SHOULDER	6F.42, 6F.105(CA), 2C.26
C31A(CA)	None	NO SHOULDER	6F.42, 6F.105(CA)
~~C33(CA)~~	W22-1	BLASTING ZONE AHEAD	6F.39
~~C34(CA)~~	W22-2	TURN OFF 2-WAY RADIO AND PHONE	6F.40
~~C35(CA)~~	W22-3	END BLASTING ZONE	6F.41
~~C36(CA)~~	W3-4	BE PREPARED TO STOP	6F.29, 2C.29
C37(CA)	None	TRAFFIC CONTROL – WAIT AND FOLLOW PILOT CAR	6F.54
C38(CA)	None	USE NEXT EXIT	6F.28

Table 6F-101(CA). California Temporary Traffic Control Signs (Sheet 2 of 2)

California Code	MUTCD Code	Title of Sign	California MUTCD Section
C40(CA)	None	TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES	6F.106(CA)
C40A(CA)	None	TRAFFIC FINES DOUBLED IN WORK ZONES	6F.106(CA)
~~C42(CA)~~	R9-11a	SIDEWALK CLOSED, (ARROW) CROSS HERE	6F.103(CA), 6F.13
SC3(CA)	None	DETOUR with Arrow	6F.53
SC5(CA)	None	SPECIAL EVENT AHEAD	6F.17
SC6A(CA)	None	Day/Month Plaque	6F.28
SC6B(CA)	None	Time Plaque	6F.28
SC6-3(CA)	None	RAMP CLOSED (Not more than one day)	6F.28
SC6-4(CA)	None	RAMP CLOSED (More than one day)	6F.28
SC7(CA)	None	RAMP CLOSED, USE RAMP AT ___	6F.28
SC8(CA)	None	___ EXIT – RAMP CLOSED	6F.28
SC9(CA)	None	FWY DETOUR with Arrow	6F.53
SC10(CA)	None	LANE CLOSED AHEAD	6F.107(CA)
SC11(CA)	None	LANE CLOSED	6F.107(CA)
~~SC12(CA)~~	W23-1	SLOW TRAFFIC AHEAD	6F.107(CA), 6F.27
SC13(CA)	None	DO NOT PASS	6F.107(CA)
SC15(CA)	None	CAUTION	6F.107(CA)
~~SC16(CA)~~	W8-12	NO CENTER STRIPE	6F.44

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Table 6F-102(CA). Maximum Spacing of Channelizing Devices

Speed (km/h)	Maximum Channelizer Spacing		
	Taper* (m)	Tangent (m)	Conflict** (m)
30	6	12	3
40	8	16	4
50	10	20	5
60	12	24	6
70	14	28	7
80	16	32	8
90	18	36	9
100	20	40	10
110	22	44	11

Speed (mph)	Maximum Channelizer Spacing		
	Taper* (ft)	Tangent (ft)	Conflict** (ft)
20	20	40	10
25	25	50	12
30	30	60	15
35	35	70	17
40	40	80	20
45	45	90	22
50	50	100	25
55	55	110	27
60	60	120	30
65	65	130	32
70	70	140	35

* Maximum channelizer spacing for all speeds on one-lane/two-way tapers is 6.1 m (20 ft).
Maximum channelizer spacing for all speeds on downstream tapers is 6.1 m (20 ft).
All other tapers are as shown.

** Use on intermediate and short-term projects for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers

CHAPTER 6G. TYPE OF TEMPORARY TRAFFIC CONTROL ZONE ACTIVITIES

Section 6G.01 Typical Applications

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

Each TTC zone is different. Many variables, such as location of work, highway type, geometrics, vertical and horizontal alignment, intersections, interchanges, road user volumes, road vehicle mix (buses, trucks, and cars), and road user speeds affect the needs of each zone. The goal of TTC in work zones is safety with minimum disruption to road users. The key factor in promoting TTC zone safety is proper judgment.

Typical applications (TAs) of TTC zones are organized according to duration, location, type of work, and highway type. Table 6H-1 is an index of these typical applications. These typical applications include the useof various TTC methods, but do not include a layout for every conceivable work situation.

Guidance:

Typical applications should be altered, when necessary, to fit the conditions of a particular TTC zone.

Option:

Other devices may be added to supplement the devices shown in the typical applications, while others may be deleted. The sign spacings and taper lengths may be increased to provide additional time or space for driver response.

Support:

Decisions regarding the selection of the most appropriate typical application to use as a guide for a specific TTC zone require an understanding of each situation. Although there are many ways of categorizing TTC zone applications, the four factors mentioned earlier (work duration, work location, work type, and highway type) are used to characterize the typical applications illustrated in Chapter 6H.

Section 6G.02 Work Duration

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

Work duration is a major factor in determining the number and types of devices used in TTC zones. The duration of a TTC zone is defined relative to the length of time a work operation occupies a spot location.

Standard:

The five categories of work duration and their time at a location shall be:

A. Long-term stationary is work that occupies a location more than 3 days.

B. Intermediate-term stationary is work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.

C. Short-term stationary is daytime work that occupies a location for more than 1 hour within a single daylight period.

D. Short duration is work that occupies a location up to 1 hour.

E. Mobile is work that moves intermittently or continuously.

Support:

At long-term stationary TTC zones, there is ample time to install and realize benefits from the full range of TTC procedures and devices that are available for use. Generally, larger channelizing devices, temporary roadways, and temporary traffic barriers are used.

Standard:

Since long-term operations extend into nighttime, retroreflective and/or illuminated devices shall be used in long-term stationary TTC zones.

Guidance:

Inappropriate markings in long-term stationary TTC zones should be removed and replaced with temporary markings.

Support:

In intermediate-term stationary TTC zones, it might not be feasible or practical to use procedures or devices that would be desirable for long-term stationary temporary traffic control zones, such as altered pavement markings, temporary traffic barriers, and temporary roadways. The increased time to place and remove these devices in some cases could significantly lengthen the project, thus increasing exposure time. In other instances, there might be insufficient pay-back time to economically justify more elaborate TTC measures.

Standard:

Since intermediate-term operations extend into nighttime, retroreflective and/or illuminated devices shall be used in intermediate-term stationary TTC zones.

Support:

Most maintenance and utility operations are short-term stationary work.

As compared to stationary operations, mobile and short-duration operations are activities that might involve different treatments. Devices having greater mobility might be necessary such as signs mounted on trucks. Devices that are larger, more imposing, or more visible can be used effectively and economically. The mobility of the TTC zone is important.

Maintaining reasonably safe work and road user conditions is a paramount goal in carrying out mobile operations.

Guidance:

Safety in short-duration or mobile operations should not be compromised by using fewer devices simply because the operation will frequently change its location.

Option:

Appropriately colored or marked vehicles with high-intensity rotating, flashing, oscillating, or strobe lights may be used in place of signs and channelizing devices for short-duration or mobile operations. These vehicles may be augmented with signs or arrow panels.

Support:

During short-duration work, it often takes longer to set up and remove the TTC zone than to perform the work. Workers face hazards in setting up and taking down the TTC zone. Also, since the work time is short, delays affecting road users are significantly increased when additional devices are installed and removed.

Option:

Considering these factors, simplified control procedures may be warranted for short-duration work. A reduction in the number of devices may be offset by the use of other more dominant devices such as high-intensity rotating, flashing, oscillating, or strobe lights on work vehicles.

Support:

Mobile operations often involve frequent short stops for activities such as litter cleanup, pothole patching, or utility operations, and are similar to short-duration operations.

Guidance:

Warning signs, high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle, flags, and/or channelizing devices should be used and moved periodically to keep them near the mobile work area.

Option:

Flaggers may be used for mobile operations that often involve frequent short stops.

Support:

Mobile operations also include work activities where workers and equipment move along the road without stopping, usually at slow speeds. The advance warning area moves with the work area.

Guidance:

When mobile operations are being performed, a shadow vehicle equipped with an arrow panel or a sign should follow the work vehicle, especially when vehicular traffic speeds or volumes are high. Where feasible, warning signs should be placed along the roadway and moved periodically as work progresses.

Under high-volume conditions, consideration should be given to scheduling mobile operations work during off-peak hours.

If there are mobile operations on a high-speed travel lane of a multi-lane divided highway, arrow panels should be used.

Option:

For mobile operations that move at speeds less than 5 km/h (3 mph), mobile signs or stationary signing that is periodically retrieved and repositioned in the advance warning area may be used.

At higher speeds, vehicles may be used as components of the TTC zones for mobile operations. Appropriately colored and marked vehicles with signs, flags, high-intensity rotating, flashing, oscillating, or strobe lights, truck-mounted attenuators, and arrow panels or portable changeable message signs may follow a train of moving work vehicles.

For some continuously moving operations, such as street sweeping and snow removal, a single work vehicle with appropriate warning devices on the vehicle may be used to provide warning to approaching road users.

Standard:

Mobile operations that move at speeds greater than 30 km/h (20 mph), such as pavement marking operations, shall have appropriate devices on the equipment (that is, high-intensity rotating, flashing, oscillating, or strobe lights, signs, or special lighting), or shall use a separate vehicle with appropriate warning devices.

Section 6G.03 Location of Work

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

The choice of TTC needed for a TTC zone depends upon where the work is located. As a general rule, the closer the work is to road users (including bicyclists and pedestrians), the greater the number of TTC devices that are needed. Procedures are described later in this Chapter for establishing TTC zones in the following locations:

A. Outside the shoulder;
B. On the shoulder with no encroachment;
C. On the shoulder with minor encroachment;
D. Within the median; and
E. Within the traveled way.

Standard:

When the work space is within the traveled way, except for short-duration and mobile operations, advance warning shall provide a general message that work is taking place and shall supply information about highway conditions. TTC devices shall indicate how vehicular traffic can move through the TTC zone.

Section 6G.04 Modifications To Fulfill Special Needs

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

The typical applications in Chapter 6H illustrate commonly encountered situations in which TTC devices are employed.

Option:

Other devices may be added to supplement the devices indicated in the typical applications, and device spacing may be adjusted to provide additional reaction time. When conditions are less complex than those depicted in the typical applications, fewer devices may be needed.

Guidance:

When conditions are more complex, typical applications should be modified by giving particular attention to the provisions set forth in Chapter 6B and by incorporating appropriate devices and practices from the following list:

A. Additional devices:
   1. Signs
   2. Arrow panels
   3. More channelizing devices at closer spacing (see Section 6F.68 for information regarding detectable edging for pedestrians)
   4. Temporary raised pavement markers
   5. High-level warning devices
   6. Portable changeable message signs
   7. Temporary traffic control signals (including pedestrian signals and accessible pedestrian signals).
   8. Temporary traffic barriers
   9. Crash cushions
   10. Screens
   11. Rumble strips
   12. More delineation

B. Upgrading of devices:
   1. A full complement of standard pavement markings
   2. Brighter and/or wider pavement markings
   3. Larger and/or brighter signs
   4. Channelizing devices with greater conspicuity
   5. Temporary traffic barriers in place of channelizing devices

C. Improved geometrics at detours or crossovers

D. Increased distances:
   1. Longer advance warning area
   2. Longer tapers

E. Lighting:
   1. Temporary roadway lighting
   2. Steady-burn lights used with channelizing devices
   3. Flashing lights for isolated hazards
   4. Illuminated signs
   5. Floodlights

Where pedestrian or bicycle usage is high, typical applications should also be modified by giving particular attention to the provisions set forth in Chapter 6D, Section 6F.68, and other Sections of Part 6 related to accessibility and detectability provisions in TTC zones.

Section 6G.05 Work Affecting Pedestrian and Bicycle Facilities

Support:

It is not uncommon, particularly in urban areas, that road work and the associated TTC will affect existing pedestrian or bicycle facilities. It is essential that the needs of all road users, including pedestrians with disabilities, are considered in TTC zones.

In addition to specific provisions identified in Sections 6G.06, 6G.07, 6G.08, 6G.10, 6G.11, 6G.12, and 6G.13, there are a number of provisions that might be applicable for all of the types of activities identified in this Chapter.

Guidance:

Where pedestrian or bicycle usage is high, the typical applications should be modified by giving particular attention to the provisions set forth in Chapters 6D and 6G, Section 6F.68, and in other Sections of Part 6 related to accessibility and detectability provisions in TTC zones.

Pedestrians should be separated from the worksite by appropriate devices that maintain the accessibility and detectability for pedestrians with disabilities.

Bicyclists and pedestrians should not be exposed to unprotected excavations, open utility access, overhanging equipment, or other such conditions.

Except for short duration and mobile operations, when a highway shoulder is occupied, a SHOULDER WORK sign should be placed in advance of the activity area. When work is performed on a paved shoulder 2.4 m (8 ft) or more in width, channelizing devices should be placed on a taper having a length that conforms to the requirements of a shoulder taper. Signs should be placed such that they do not narrow any existing pedestrian passages to less than 1200 mm (48 in).

Pedestrian detours should be avoided since pedestrians rarely observe them and the cost of providing accessibility and detectability might outweigh the cost of maintaining a continuous route. Whenever possible, work should be done in a manner that does not create a need to detour pedestrians from existing routes or crossings.

Standard:

Where pedestrian routes are closed, alternate pedestrian routes shall be provided.

When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Section 6G.06 Work Outside of Shoulder

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

When work is being performed off the roadway (beyond the shoulders, but within the right-of-way), little or no TTC might be needed. TTC generally is not needed where work is confined to an area 4.6 m (15 ft) or more from the edge of the traveled way. However, TTC is appropriate where distracting situations exist, such as vehicles parked on the shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform the work operations (for example, mowing). For work beyond the shoulder, see Figure ~~6H-1~~ 6H-1(CA).

Guidance:

Where the above situations exist, a single warning sign, such as ~~ROAD WORK AHEAD,~~ Workers (W21-1a) sign, should be used. If the equipment travels on the roadway, the equipment should be equipped with appropriate flags, high-intensity rotating, flashing, oscillating, or strobe lights, and/or a SLOW MOVING VEHICLE sign.

Support:

Refer to Section 6F.31 for Workers (W21-1a) sign.

Option:

If work vehicles are on the shoulder, a SHOULDER WORK sign may be used. For mowing operations, the sign MOWING AHEAD may be used.

Where the activity is spread out over a distance of more than 3.2 km (2 mi), the SHOULDER WORK sign may be repeated every 1.6 km (1 mi).

A supplementary plaque with the message NEXT X ~~km~~ (MILES) may be used.

Guidance:

A general warning sign like ROAD MACHINERY AHEAD should be used if workers and equipment must occasionally move onto the shoulder.

Section 6G.07 Work on the Shoulder with No Encroachment

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

The provisions of this Section apply to short-term through long-term stationary operations.

Standard:

When paved shoulders having a width of 2.4 m (8 ft) or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct motor vehicle traffic to remain within the traveled way.

Guidance:

When paved shoulders having a width of 2.4 m (8 ft) or more are closed on freeways and expressways, road users should be warned about potential disabled vehicles that cannot get off the traveled way. An initial general warning sign (such as ROAD WORK AHEAD) should be used, followed by a RIGHT or LEFT SHOULDER CLOSED sign. Where the end of the shoulder closure extends beyond the distance which can be perceived by road users, a supplementary plaque bearing the message NEXT X ~~METERS~~ (FEET) or ~~km~~ (MILES) should be placed below the SHOULDER CLOSED sign. On multi-lane, divided highways, signs advising of shoulder work or the condition of the shoulder should be placed only on the side of the affected shoulder.

When an improved shoulder is closed on a high-speed roadway, it should be treated as a closure of a portion of the road system because road users expect to be able to use it in emergencies. Road users should be given ample advance warning that shoulders are closed for use as refuge areas throughout a specified length of the approaching TTC zone. The sign(s) should read SHOULDER CLOSED with distances indicated. The work space on the shoulder should be closed off by a taper or channelizing devices with a length of 0.33 L using the formulas in Table 6C-3.

When the shoulder is not occupied but work has adversely affected its condition, the LOW SHOULDER or SOFT SHOULDER sign should be used, as appropriate.

Where the condition extends over a distance in excess of 1.6 km (1 mi), the sign should be repeated at 1.6 km (1 mi) intervals.

Option:

In addition, a supplementary plaque bearing the message NEXT X ~~km~~ (MILES) may be used. Temporary traffic barriers may be needed to inhibit encroachment of errant vehicles into the work space and to protect workers.

Standard:

When used for shoulder work, arrow panels shall operate only in the caution mode.

Support:

A typical application for stationary work operations on shoulders is shown in Figure 6H-3. Short duration or mobile work on shoulders is shown in Figure ~~6H-4~~ 6H-4(CA). Work on freeway shoulders is shown in Figure ~~6H-5~~ 6H-5(CA).

Section 6G.08 Work on the Shoulder with Minor Encroachment

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

Guidance:

When work takes up part of a lane, vehicular traffic volumes, vehicle mix (buses, trucks, cars, and bicycles), speed, and capacity should be analyzed to determine whether the affected lane should be closed. Unless the lane encroachment permits a remaining lane width of 3 m (10 ft), the lane should be closed.

Truck off-tracking should be considered when determining whether the minimum lane width of 3 m (10 ft) is adequate.

Option:

A lane width of 2.7 m (9 ft) may be used for short-term stationary work on low-volume, low-speed roadways when vehicular traffic does not include longer and wider heavy commercial vehicles.

Support:

Figure 6H-6 illustrates a method for handling vehicular traffic where the stationary or short duration work space encroaches slightly into the traveled way.

Section 6G.09 Work Within the Median

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

Guidance:

If work in the median of a divided highway is within 4.6 m (15 ft) from the edge of the traveled way for either direction of travel, TTC should be used through the use of advance warning signs and channelizing devices.

Section 6G.10 Work Within the Traveled Way of Two-Lane Highways

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

Detour signs are used to direct road users onto another roadway. At diversions, road users are directed onto a temporary roadway or alignment placed within or adjacent to the right-of-way. Typical applications for detouring or diverting road users on two-lane highways are shown in Figures ~~6H-7~~ 6H-7(CA), 6H-8, and 6H-9. Figure ~~6H-7~~ 6H-7(CA) illustrates the controls around an area where a section of roadway has been closed and a diversion has been constructed. Channelizing devices and pavement markings are used to indicate the transition to the temporary roadway.

Guidance:

When a detour is long, Detour (M4-8, M4-9) signs should be installed to remind and reassure road users periodically that they are still successfully following the detour.

When an entire roadway is closed, as illustrated in Figure 6H-8, a detour should be provided and road users should be warned in advance of the closure, which in this example is a closure 16 km (10 mi) from the intersection. If local road users are allowed to use the roadway up to the closure, the ROAD CLOSED AHEAD, LOCAL TRAFFIC ONLY sign should be used. The portion of the road open to local road users should have adequate signing, marking, and delineation.

Detours should be signed so that road users will be able to traverse the entire detour route and back to the original roadway as shown in Figure 6H-9.

Support:

Techniques for controlling vehicular traffic under one-lane, two-way conditions are described in Section 6C.10.

Option:

Flaggers may be used as shown in Figure ~~6H-10~~ 6H-10(CA).

STOP/YIELD sign control may be used on roads with low traffic volumes as shown in Figure 6H-11.

A temporary traffic control signal may be used as shown in Figure ~~6H-12~~ 6H-12(CA).

Support:

Refer to CVC 21363 for detour signs.

Section 6G.11 Work Within the Traveled Way of Urban Streets

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

In urban TTC zones, decisions are needed on how to control vehicular traffic, such as how many lanes are required, whether any turns need to be prohibited at intersections, and how to maintain access to business, industrial, and residential areas.

Pedestrian traffic needs separate attention. Chapter 6D contains information regarding pedestrian movements near TTC zones.

Standard:

If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided. If the TTC zone affects an accessible and detectable pedestrian facility, the accessibility and detectability shall be maintained along the alternate pedestrian route.

If the TTC zone affects the movement of bicyclists, adequate access to the roadway or shared-use paths shall be provided (see Part 9).

Where transit stops are affected or relocated because of work activity, access to temporary transit stops shall be provided.

Guidance:

If a designated bicycle route is closed because of the work being done, a signed alternate route should be provided. Bicyclists should not be directed onto the path used by pedestrians.

Work sites within the intersection should be protected against inadvertent pedestrian incursion by providing detectable channelizing devices.

Support:

Utility work takes place both within and outside the roadway to construct and maintain services such as power, gas, light, water, or telecommunications. Operations often involve intersections, since that is where many of the network junctions occur. The work force is usually small, only a few vehicles are involved, and the number and types of TTC devices placed in the TTC zone is usually minimal.

Standard:

All TTC devices shall be retroreflective or illuminated if utility work is performed during nighttime hours.

Guidance:

As discussed under short-duration projects, however, the reduced number of devices in utility work zones should be offset by the use of high-visibility devices, such as high-intensity rotating, flashing, oscillating, or strobe lights on work vehicles or high-level warning devices.

Support:

Figures 6H-6, ~~6H-10~~ 6H-10(CA), 6H-15, 6H-18, 6H-21, 6H-22, 6H-23, 6H-26, and 6H-33 are examples of typical applications for utility operations. Other typical applications might apply as well.

Section 6G.12 Work Within the Traveled Way of Multi-lane, Nonaccess Controlled Highways

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

Work on multi-lane (two or more lanes of moving motor vehicle traffic in one direction) highways is divided into right-lane closures, left-lane closures, interior-lane closures, multiple-lane closures, and closures on five-lane roadways.

Standard:

When a lane is closed on a multi-lane road for other than a mobile operation, a transition area containing a merging taper shall be used.

Guidance:

When justified by an engineering study, temporary traffic barriers should be used to prevent incursions of errant vehicles into hazardous areas or work space.

Standard:

When temporary traffic barriers are placed immediately adjacent to the traveled way, they shall be equipped with appropriate channelizing devices, delineation, and/or other TTC devices. For lane closures, the merging taper shall use channelizing devices and the temporary traffic barrier shall be placed beyond the transition area.

Support:

It must be recognized that although temporary traffic barriers are shown in several of the typical applications of Chapter 6H, they are not considered to be TTC devices in themselves.

Figure 6H-34 illustrates a lane closure in which temporary traffic barriers are used.

Option:

When the right lane is closed, TTC similar to that shown in Figure 6H-33 may be used for undivided or divided four-lane roads.

Guidance:

If morning and evening peak hour vehicular traffic volumes in the two directions are uneven and the greater volume is on the side where the work is being done in the right lane, consideration should be given to closing the inside lane for opposing vehicular traffic and making the lane available to the side with heavier vehicular traffic, as shown in Figure ~~6H-31~~ 6H-31(CA).

If the larger vehicular traffic volume changes to the opposite direction at a different time of the day, the TTC should be changed to allow two lanes for opposing vehicular traffic by moving the devices from the opposing lane back to the centerline. When it is necessary to create a temporary centerline that is not consistent with the pavement markings, channelizing devices should be used and closely spaced.

Option:

When closing a left lane on a multi-lane undivided road, as vehicular traffic flow permits, the two interior lanes may be closed, as shown in Figure 6H-30, to provide drivers and workers additional lateral clearance and to provide access to the work space.

Standard:

When only the left lane is closed on undivided roads, channelizing devices shall be placed along the centerline as well as along the adjacent lane.

Guidance:

When an interior lane is closed, an adjacent lane should also be considered for closure to provide additional space for vehicles and materials and to facilitate the movement of equipment within the work space.

When multiple lanes in one direction are closed, a capacity analysis should be made to determine the number of lanes needed to accommodate motor vehicle traffic needs. Vehicular traffic should be moved over one lane at a time. ~~As shown in Figure 6H-37, t~~The tapers should be separated by a distance of 2L, with L being determined by the formulas in Table 6C-3.

Standard:

When a directional roadway is closed, inapplicable WRONG WAY signs and markings, and other existing traffic control devices at intersections within the temporary two-lane, two-way operations section shall be covered, removed, or obliterated.

Option:

When half the road is closed on an undivided highway, both directions of vehicular traffic may be accommodated as shown in Figure ~~6H-32~~ 6H-32(CA). When both interior lanes are closed, temporary traffic controls may be used as indicated in Figure 6H-30. When a roadway must be closed on a divided highway, a median crossover may be used (see Section ~~6G.15~~ 6G.16).

Support:

TTC for lane closures on five-lane roads is similar to other multi-lane undivided roads. Figure ~~6H-32~~ 6H-32(CA) can be adapted for use on five-lane roads. Figure 6H-35 can be used on a five-lane road for short duration and mobile operations.

Guidance:

When multiple lanes in one direction are closed, traffic should be moved over one lane at a time as shown in Department of Transportation's Standard Plan T10. See Section 1A.11 for information regarding this publication.

Section 6G.13 Work Within the Traveled Way at an Intersection

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

The typical applications for intersections are classified according to the location of the work space with respect to the intersection area (as defined by the extension of the curb or edge lines). The three classifications are near side, far side, and in-the-intersection. Work spaces often extend into more than one portion of the intersection. For example, work in one quadrant often creates a near-side work space on one street and a far-side work space on the cross street. In such instances, an appropriate TTC plan is obtained by combining features shown in two or more of the intersection and pedestrian typical applications.

TTC zones in the vicinity of intersections might block movements and interfere with normal road user flows. Such conflicts frequently occur at more complex signalized intersections having such features as traffic signal heads over particular lanes, lanes allocated to specific movements, multiple signal phases, signal detectors for actuated control, and accessible pedestrian signals and detectors.

Guidance:

The effect of the work upon signal operation should be considered, such as signal phasing for ensuring adequate capacity, maintaining or adjusting signal detectors, and ensuring the appropriate visibility of signal heads.

Standard:

When work will occur near an intersection where operational, capacity, or pedestrian accessibility problems are anticipated, the highway agency having jurisdiction shall be contacted.

Guidance:

For work at an intersection, advance warning signs, devices, and markings should be used on all cross streets, as appropriate. The typical applications depict urban intersections on arterial streets. Where the posted speed limit, the off-peak 85th-percentile speed prior to the work starting, or the anticipated speed exceeds 60 km/h (40 mph), additional warning signs should be used in the advance warning area.

Pedestrian crossings near TTC sites should be separated from the worksite by appropriate barriers that maintain the accessibility and detectability for pedestrians with disabilities.

Support:

Near-side work spaces, as depicted in Figure 6H-21, are simply handled as a midblock lane closure. A problem that might occur with near-side lane closure is a reduction in capacity, which during certain hours of operation could result in congestion and backups.

Option:

When near-side work spaces are used, an exclusive turn lane may be used for through vehicular traffic.

Where space is restricted in advance of near-side work spaces, as with short block spacings, two warning signs may be used in the advance warning area, and a third action-type warning or a regulatory sign (such as Keep Left) may be placed within the transition area.

Support:

Far-side work spaces, as depicted in Figures 6H-22 through 6H-25, involve additional treatment because road users typically enter the activity area by straight-through and left- or right-turning movements.

Guidance:

When a lane through an intersection must be closed on the far side, it should also be closed on the near-side approach to preclude merging movements within the intersection.

Option:

If there are a significant number of vehicles turning from a near-side lane that is closed on the far side, the near-side lane may be converted to an exclusive turn lane.

Support:

Figures 6H-26 and 6H-27 provide guidance on applicable procedures for work performed within the intersection.

Option:

If the work is within the intersection, any of the following strategies may be used:

A. A small work space so that road users can move around it, as shown in Figure 6H-26;
B. Flaggers or uniformed law enforcement officers to direct road users, as shown in Figure 6H-27;
C. Work in stages so the work space is kept to a minimum; and
D. Road closures or upstream diversions to reduce road user volumes.

Guidance:

Depending on road user conditions, a flagger(s) and/or a uniformed law enforcement officer(s) should be used to control road users.

Section 6G.14 Work Within the Traveled Way of Freeways and Expressways

Support:

Problems of TTC might occur under the special conditions encountered where vehicular traffic must be moved through or around TTC zones on high-speed, high-volume roadways. Although the general principles outlined in the previous Sections of this Manual are applicable to all types of highways, high-speed, access-controlled highways need special attention in order to reasonably safely and efficiently accommodate vehicular traffic while also protecting work forces. The road user volumes, road vehicle mix (buses, trucks, cars, and bicycles, if permitted), and speed of vehicles on these facilities require that careful TTC procedures be implemented, for example, to induce critical merging maneuvers well in advance of work spaces and in a manner that creates minimum turbulence and delay in the vehicular traffic stream. These situations often require more conspicuous devices than specified for normal rural highway or urban street use. However, the same important basic considerations of uniformity and standardization of general principles apply for all roadways.

Work under high-speed, high-volume vehicular traffic on a controlled access highway is complicated by the roadway design and operational features. The presence of a median that establishes separate roadways for directional vehicular traffic flow might prohibit the closing of one of the roadways or the diverting of vehicular traffic to the other roadway. Lack of access to and from adjacent roadways prohibits rerouting of vehicular traffic away from the work space in many cases. Other conditions exist where work must be limited to night hours, thereby necessitating increased use of warning lights, illumination of work spaces, and advance warning systems.

TTC for a typical lane closure on a divided highway is shown in Figure 6H-33. Temporary traffic controls for short duration and mobile operations on freeways are shown in Figure 6H-35. A typical application for shifting vehicular traffic lanes around a work space is shown in Figure 6H-36. TTC for multiple and interior lane closures on a freeway is shown in ~~Figures 6H-37 and 6H-38~~ Department of Transportation's Standard Plan T10. See Section 1A.11 for information regarding this publication.

~~Guidance:~~

~~The method for closing an interior lane when the open lanes have the capacity to carry vehicular traffic should be as shown in Figure 6H-37. When the capacity of the other lanes is needed, the method shown in Figure 6H-38 should be used.~~

Support:

The temporary traffic controls for short duration and mobile operations on State highways are shown in Department of Transportation's Standard Plans T15, T16 and T17.

A typical layout of closing lanes to direct traffic around a workspace is shown in Department of Transportation's Standard Plan T10.

See Section 1A.11 for information regarding this publication.

Section 6G.15 Two-Lane, Two-Way Traffic on One Roadway of a Normally Divided Highway

Support:

Two-lane, two-way operation on one roadway of a normally divided highway is a typical procedure that requires special consideration in the planning, design, and work phases, because unique operational problems (for example, increasing the risk of head-on crashes) can arise with the two-lane, two-way operation.

Standard:

When two-lane, two-way traffic control must be maintained on one roadway of a normally divided highway, opposing vehicular traffic shall be separated with either temporary traffic barriers (concrete safety-shape or approved alternate) or with channelizing devices throughout the length of the two-way operation. The use of markings and complementary signing, by themselves, shall not be used.

Support:

Figure 6H-39 shows the procedure for two-lane, two-way operation. Treatments for entrance and exit ramps within the two-way roadway segment of this type of work are shown in Figures 6H-40 and 6H-41.

Support:

Treatments for entrance and exit ramps within the two-way roadway segment of this type of work are shown in Department of Transportation's Standard Plans T10 and T14. See Section 1A.11 for information regarding this publication.

Section 6G.16 Crossovers

Guidance:

The following are considered good guiding principles for the design of crossovers:

A. Tapers for lane drops should be separated from the crossovers, as shown in Figure 6H-39.
B. Crossovers should be designed for speeds no lower than 16 km/h (10 mph) below the posted speed, the off-peak 85th-percentile speed prior to the work starting, or the anticipated operating speed of the roadway, unless unusual site conditions require that a lower design speed be used.
C. A good array of channelizing devices, delineators, and full-length, properly placed pavement markings should be used to provide drivers with a clearly defined travel path.
D. The design of the crossover should accommodate all vehicular traffic, including trucks and buses.

Support:

Temporary traffic barriers and the excessive use of TTC devices cannot compensate for poor geometric and roadway cross-section design of crossovers.

Section 6G.17 Interchanges

Guidance:

Access to interchange ramps on limited-access highways should be maintained even if the work space is in the lane adjacent to the ramps. Access to exit ramps should be clearly marked and delineated with channelizing devices. For long-term projects, conflicting pavement markings should be removed and new ones placed. Early coordination with officials having jurisdiction over the affected cross streets and providing emergency services should occur before ramp closings.

Option:

If access is not possible, ramps may be closed by using signs and Type III barricades. As the work space changes, the access area may be changed, as shown in Figure 6H-42. A TTC zone in the exit ramp may be handled as shown in Figure 6H-43.

When a work space interferes with an entrance ramp, a lane may need to be closed on the freeway (see Figure 6H-44). A TTC zone in the entrance ramp may require shifting ramp vehicular traffic (see Figure 6H-44).

Option:

A temporary traffic control zone in the entrance and exit ramps may be handled as shown in Department of Transportation's Standard Plans T10 and T14. See Section 1A.11 for information regarding this publication.

Section 6G.18 Movable Barriers

Support:

Figure 6H-45 shows a temporary reversible lane using movable barriers.

Option:

If the work activity in Figure 6H-34 permits, a movable barrier may be used and relocated to the shoulder during nonwork periods or peak-period vehicular traffic conditions.

Section 6G.19 Work in the Vicinity of Highway-Rail Grade Crossings

Standard:

When highway-rail grade crossings exist either within or in the vicinity of a TTC zone, lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed

law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

Support:

Figure 6H-46 shows work in the vicinity of a highway-rail grade crossing.

Guidance:

Early coordination with the railroad company should occur before work starts.

Section 6G.20 Temporary Traffic Control During Nighttime Hours

Standard:

Highway construction work lighting shall be as per Construction Safety Order 1523 (California Code of Regulations Title 8, Division 1, Chapter 4, Subchapter 4, Article 3, Section 1523 - Illumination). See See Section 1A.11 for information regarding this publication.

Support:

Chapter 6D and Sections 6F.68 and 6G.05 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

Conducting highway construction and maintenance activities during night hours could provide an advantage when traditional daytime traffic control strategies cannot achieve an acceptable balance between worker and public safety, traffic and community impact, and constructability. The two basic advantages of working at night are reduced traffic congestion and less involvement with business activities. However, the two basic conditions that must normally be met for night work to offer any advantage are reduced traffic volumes and easy set up and removal of the traffic control patterns on a nightly basis.

Shifting work activities to night hours, when traffic volumes are lower and normal business is less active, might offer an advantage in some cases, as long as the necessary work can be completed and the work site restored to essentially normal operating conditions to carry the higher traffic volume during non-construction hours.

Although working at night might offer advantages, it also includes safety issues. Reduced visibility inherent in night work impacts the performance of both drivers and workers. Because traffic volumes are lower and congestion is minimized, speeds are often higher at night necessitating greater visibility at a time when visibility is reduced. Finally, the incidence of impaired (alcohol or drugs), fatigued, or drowsy drivers might be higher at night.

Working at night also involves other factors, including construction productivity and quality, social impacts, economics, and environmental issues. A decision to perform construction or maintenance activities at night normally involves some consideration of the advantages to be gained compared to the safety and other issues that might be impacted.

Guidance:

Considering the safety issues inherent to night work, consideration should be given to enhancing traffic controls (see Section 6G.04) to provide added visibility and driver guidance, and increased protection for workers.

In addition to the enhancements listed in Section 6G.04, consideration should be given to providing additional lights and retroreflective markings to workers, work vehicles, and equipment.

Option:

Where reduced traffic volumes at night make it feasible, the entire roadway may be closed by detouring traffic to alternate facilities, thus removing the traffic risk from the activity area.

Guidance:

Because typical street and highway lighting is rarely adequate to provide sufficient levels of illumination for work tasks, temporary lighting should be provided where workers are active to supply sufficient illumination to reasonably safely perform the work tasks.

Temporary lighting for night work should be designed such that glare does not interfere with driver visibility, or create visibility problems for truck drivers, equipment operators, flaggers, or other workers.

Consideration should also be given to stationing uniformed law enforcement officers and lighted patrol cars at night work locations where there is a concern that high speeds or impaired drivers might result in undue risks for workers or other drivers.

Standard:

Except in emergencies, temporary lighting shall be provided at all flagger stations.

Support:

Refer to Construction Safety Order in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 4, Article 11, Section 1599 - Flaggers). See See Section 1A.11 for information regarding this publication.

Desired illumination levels vary depending upon the nature of the task involved. An average horizontal luminance of 50 lux (5 foot candles) can be adequate for general activities. An average horizontal luminance of 108 lux (10 foot candles) can be adequate for activities around equipment. Tasks requiring high levels of precision and extreme care can require an average horizontal luminance of 216 lux (20 foot candles).

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CHAPTER 6H. TYPICAL APPLICATIONS

Section 6H.01 Typical Applications

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

Chapter 6G contains discussions of typical TTC activities. Chapter 6H presents typical applications for a variety of situations commonly encountered. While not every situation is addressed, the information illustrated can generally be adapted to a broad range of conditions. In many instances, an appropriate TTC plan is achieved by combining features from various typical applications. For example, work at an intersection might present a near-side work zone for one street and a far-side work zone for the other street. These treatments are found in two different typical applications, while a third typical application shows how to handle pedestrian crosswalk closures. For convenience in using the typical application diagrams, Tables 6C-1 and 6C-4 are reproduced in this Chapter as Tables 6H-3 and 6H-4, respectively.

Procedures for establishing TTC zones vary with such conditions as road configuration, location of the work, work activity, duration of work, road user volumes, road vehicle mix (buses, trucks, cars, motorcycles, and bicycles), and road user speeds. Examples are presented in this Chapter showing how to apply principles and standards. Applying these guidelines to actual situations and adjusting to field conditions requires judgment. In general, the procedures illustrated represent minimum solutions for the situations depicted.

Option:

Other devices may be added to supplement the devices and device spacing may be adjusted to provide additional reaction time or delineation. Fewer devices may be used based on field conditions.

Support:

Figures and tables found throughout Part 6 provide information for the development of TTC plans. Also, Table 6H-3 is used for the determination of sign spacing and other dimensions for various area and roadway types.

Table 6H-1 is an index of the 46 typical applications. Typical applications are shown on the right page with notes on the facing page to the left. The legend for the symbols used in the typical applications is provided in Table 6H-2. In many of the typical applications, sign spacings and other dimensions are indicated by letters using the criteria provided in Table 6H-3. The formulas for determining taper lengths are provided in Table 6H-4.

Most of the typical applications show TTC devices for only one direction.

Guidance:

The spacing of channelizing devices should not exceed the maximum distances shown in Table 6F-102(CA).

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Table 6H-1. Index to Typical Applications (Sheet 1 of 2)

Typical Application Description	Typical Application Number
Work Outside of Shoulder (see Section 6G.06)	
Work Beyond the Shoulder	TA-1
Blasting Zone	TA-2
Work on the Shoulder (see Sections 6G.07 and 6G.08)	
Work on Shoulders	TA-3
Short Duration or Mobile Operation on Shoulder	TA-4
Shoulder Closure on Freeway	TA-5
Shoulder Work with Minor Encroachment	TA-6
Work Within the Traveled Way of Two-Lane Highways (see Section 6G.10)	
Road Closed with Diversion	TA-7
Roads Closed with Off-Site Detour	TA-8
Overlapping Routes with Detour	TA-9
Lane Closure on Two-Lane Road Using Flaggers	TA-10
Lane Closure on Two-Lane Road with Low Traffic Volumes	TA-11
Lane Closure on Two-Lane Road Using Traffic Control Signals	TA-12
Temporary Road Closure	TA-13
Haul Road Crossing	TA-14
Work in Center of Road with Low Traffic Volumes	TA-15
Surveying Along Centerline of Road with Low Traffic Volumes	TA-16
Mobile Operations on Two-Lane Road	TA-17
Work Within the Traveled Way of Urban Streets (see Section 6G.11)	
Lane Closure on Minor Street	TA-18
Detour for One Travel Direction	TA-19
Detour for Closed Street	TA-20
Work Within the Traveled Way at an Intersection and Sidewalks (see Section 6G.13)	
Lane Closure on Near Side of Intersection	TA-21
Right Lane Closure on Far Side of Intersection	TA-22
Left Lane Closure on Far Side of Intersection	TA-23
Half Road Closure on Far Side of Intersection	TA-24
Multiple Lane Closures at Intersection	TA-25
Closure in Center of Intersection	TA-26
Closure at Side of Intersection	TA-27
Sidewalk Closures and Bypass Sidewalks	TA-28
Crosswalk Closures and Pedestrian Detours	TA-29

Table 6H-1. Index to Typical Applications (Sheet 2 of 2)

Typical Application Description	Typical Application Number
Work Within the Traveled Way of Multi-lane, Nonaccess Controlled Highways (see Section 6G.12)	
Interior Lane Closure on Multi-lane Street	TA-30
Lane Closure on Street with Uneven Directional Volumes	TA-31
Half Road Closure on Multi-lane, High-Speed Highway	TA-32
Lane Closure on Divided Highway	TA-33
Lane Closure with Temporary Traffic Barrier	TA-34
Mobile Operation on Multi-lane Road	TA-35
Work Within the Traveled Way of Expressways and Freeways (see Section 6G.14)	
Lane Shift on Freeway	TA-36
Double Lane Closure on Freeway	TA-37
Interior Lane Closure on Freeway	TA-38
Median Crossover on Freeway	TA-39
Median Crossover for Entrance Ramp	TA-40
Median Crossover for Exit Ramp	TA-41
Work in Vicinity of Exit Ramp	TA-42
Partial Exit Ramp Closure	TA-43
Work in Vicinity of Entrance Ramp	TA-44
Temporary Reversible Lane Using Movable Barriers	TA-45
Work in the Vicinity of Highway-Rail Grade Crossings (see Section 6G.19)	
Work in Vicinity of Highway-Rail Grade Crossing	TA-46

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Table 6H-2. Meaning of Symbols on Typical Application Diagrams

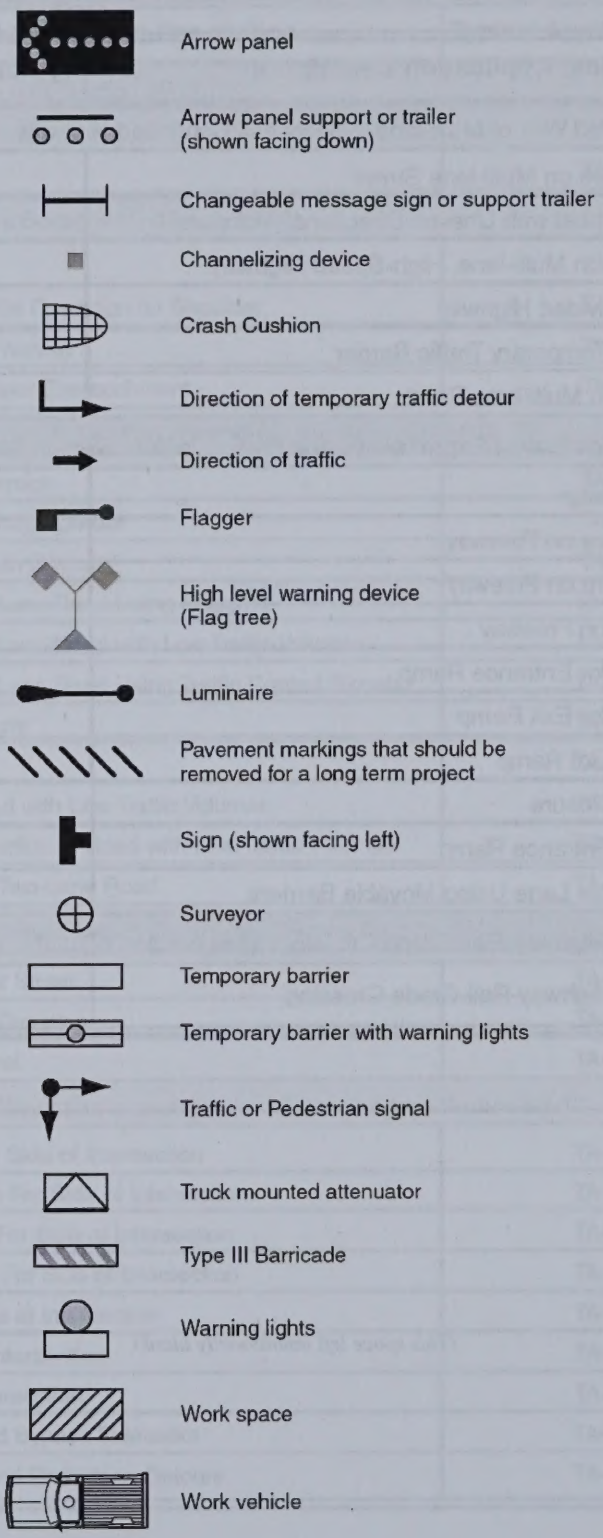

Table 6H-3. Meaning of Letter Codes on Typical Application Diagrams

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	30 (100)	30 (100)	30 (100)
Urban (high speed)*	100 (350)	100 (350)	100 (350)
Rural	150 (500)	150 (500)	150 (500)
Expressway / Freeway	300 (1,000)	450 (1,500)	800 (2,640)

* Speed category to be determined by highway agency

** Distances are shown in meters (feet). The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The third sign is the first one in a three-sign series encountered by a driver approaching a TTC zone.)

Table 6H-4. Formulas for Determining Taper Lengths

Speed Limit (S)	Taper Length (L) Meters
60 km/h or less	$L = \frac{WS^2}{155}$
70 km/h or more	$L = \frac{WS}{1.6}$

Speed Limit (S)	Taper Length (L) Feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in meters (feet)
W = width of offset in meters (feet)
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in km/h (mph)

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Notes for Figure ~~6H-1~~ 6H-1(CA)—Typical Application 1

Work Beyond the Shoulder

Guidance:

1. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

Option:

2. The ~~ROAD WORK AHEAD sign~~ Workers (W21-1a) sign may be replaced with other appropriate signs such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. The ~~ROAD WORK AHEAD sign~~ Workers (W21-1a) sign may be omitted where the work space is behind a barrier, more than 600 mm (24 in) behind the curb, or 4.6 m (15 ft) or more from the edge of any roadway.
4. For short-term, short-duration or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

6. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

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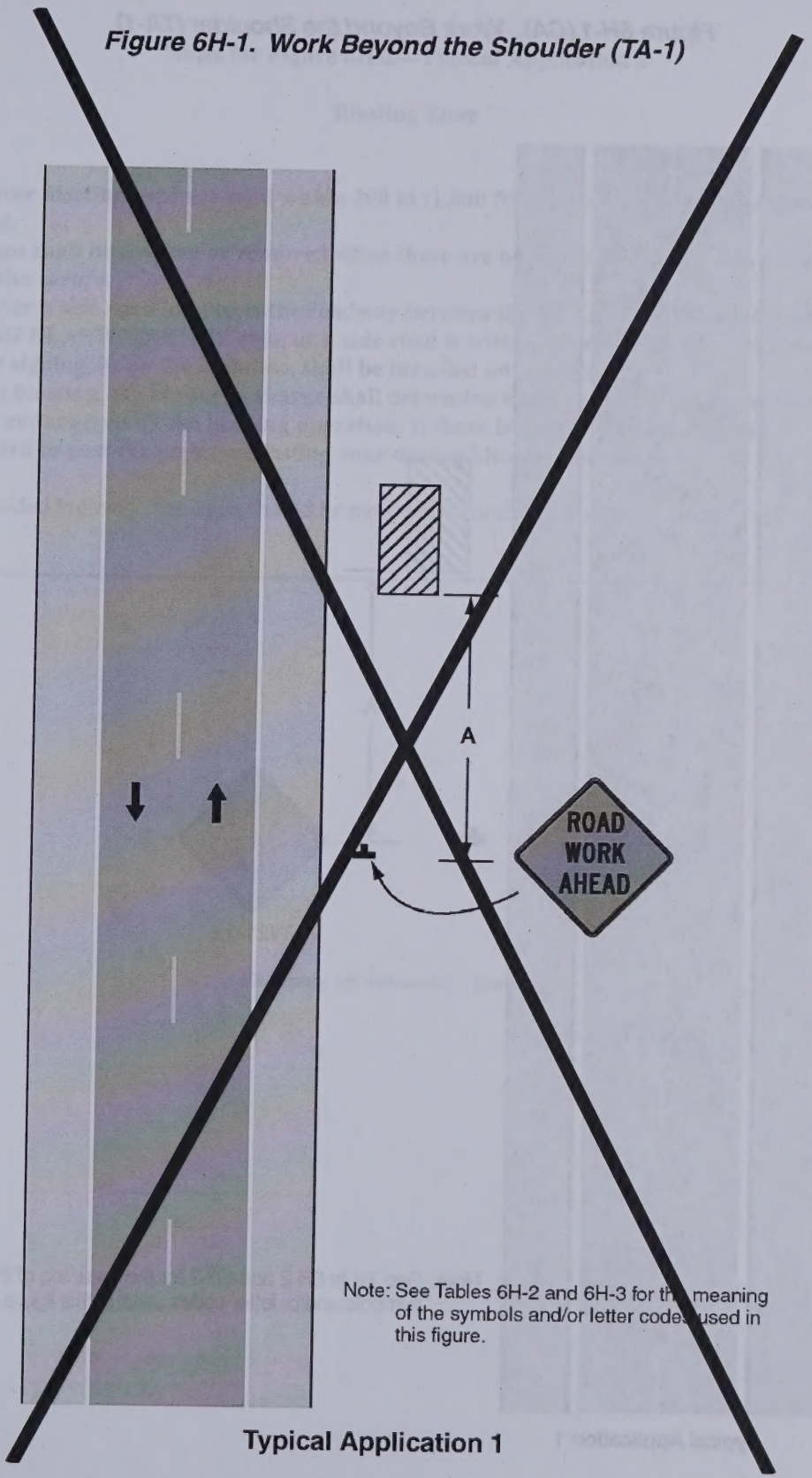
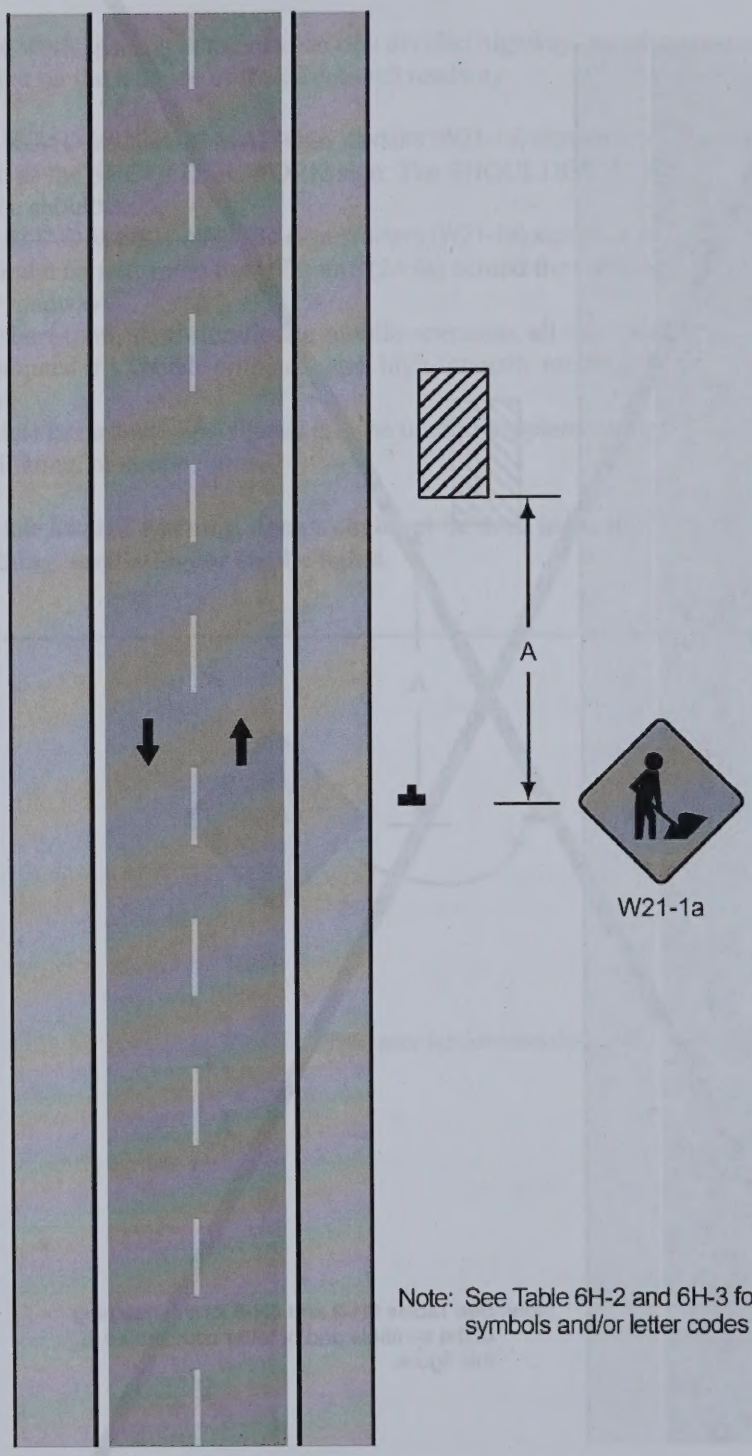
Figure 6H-1. Work Beyond the Shoulder (TA-1)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 1

Figure 6H-1 (CA). Work Beyond the Shoulder (TA-1)



Note: See Table 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 1

Notes for Figure 6H-2—Typical Application 2

Blasting Zone

Standard:

1. **Whenever blasting caps are used within 300 m (1,000 ft) of a roadway, the signing shown shall be used.**
2. **The signs shall be covered or removed when there are no explosives in the area or the area is otherwise secure.**
3. **Whenever a side road intersects the roadway between the BLASTING ZONE AHEAD sign and the END BLASTING ZONE sign, or a side road is within 300 m (1,000 ft) of any blasting cap, similar signing, as on the mainline, shall be installed on the side road.**
4. **Prior to blasting, the blaster in charge shall determine whether road users in the blasting zone will be endangered by the blasting operation. If there is danger, road users shall not be permitted to pass through the blasting zone during blasting operations.**

Guidance:

5. On a divided highway, the signs should be mounted on both sides of the directional roadways.

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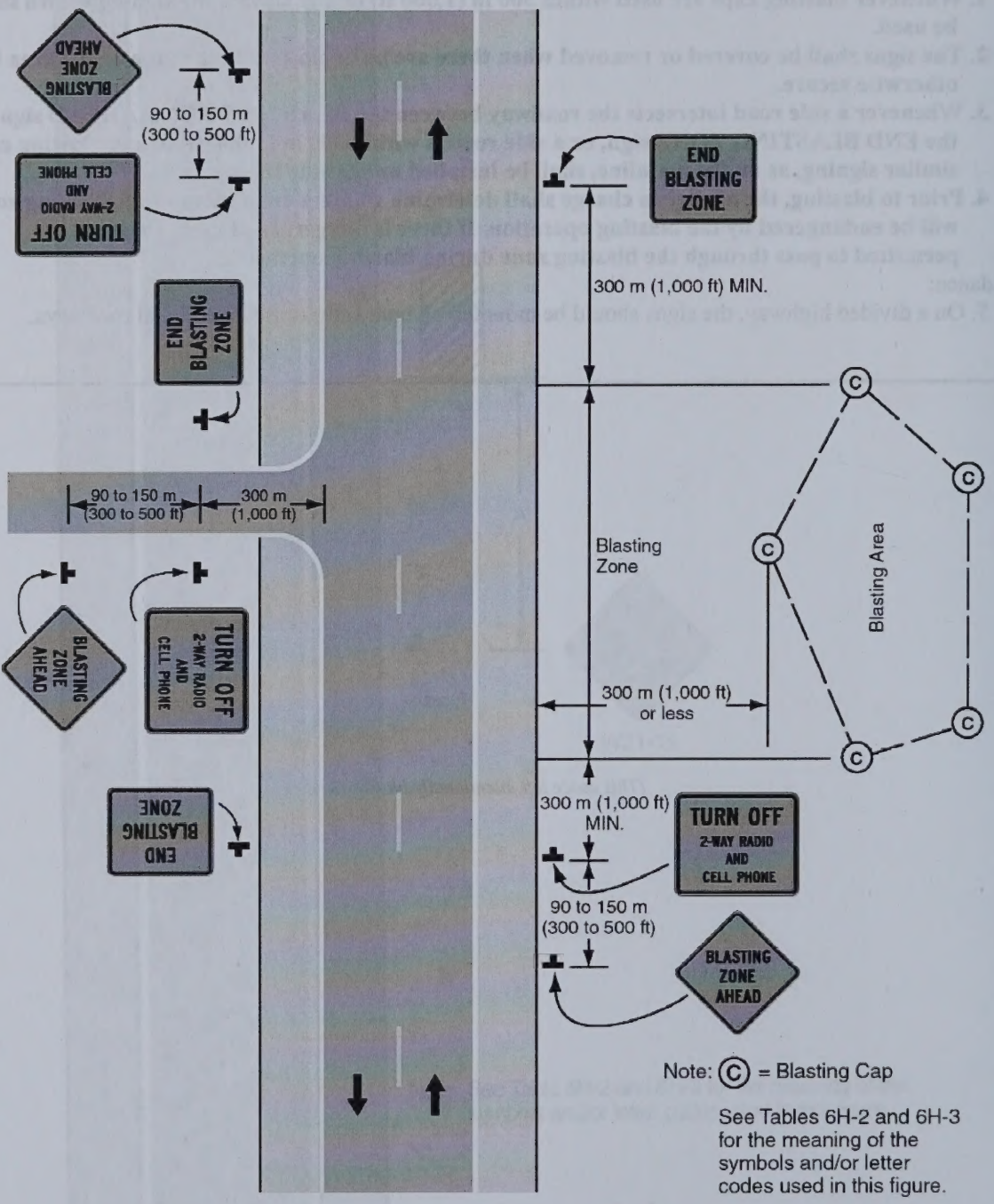
Figure 6H-2. Blasting Zone (TA-2)



Typical Application 2

Notes for Figure 6H-3—Typical Application 3

Work on Shoulders

Guidance:

1. A SHOULDER WORK sign should be placed on the left side of the roadway for a divided or one-way street only if the left shoulder is affected.

Option:

2. The Workers symbol signs may be used instead of SHOULDER WORK signs.
3. The SHOULDER WORK AHEAD sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.
4. For short-duration operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

6. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
7. **When paved shoulders having a width of 2.4 m (8 ft) or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the traveled way.**

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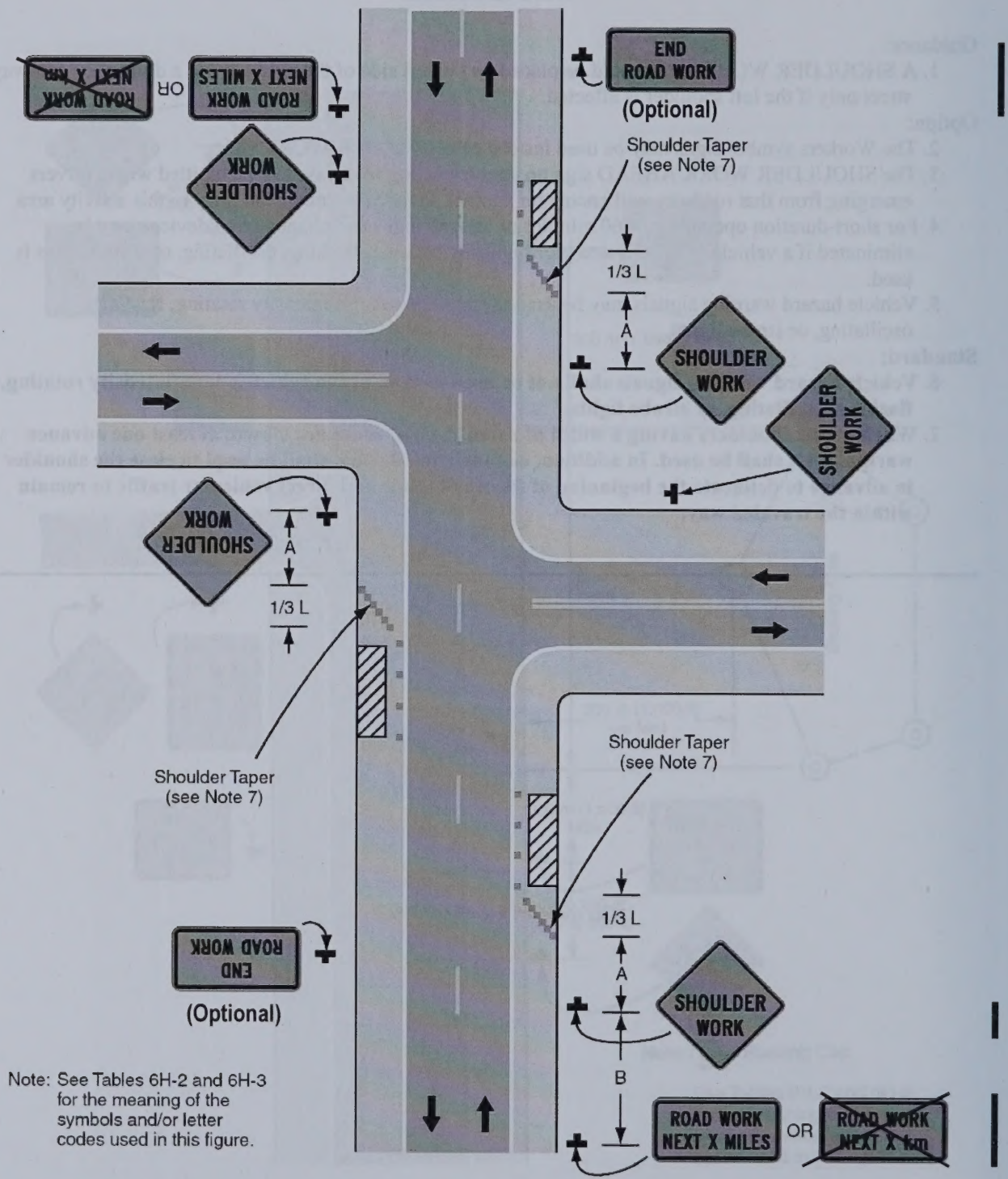
Figure 6H-3. Work on Shoulders (TA-3)



Typical Application 3

Notes for Figure ~~6H-4~~ 6H-4(CA)—Typical Application 4

Short-Duration or Mobile Operation on Shoulder

Guidance:

1. In those situations where multiple work locations within a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 8 km (5 mi).
2. In those situations where the distance between the advance signs and the work is 3.2 km (2 mi) to 8 km (5 mi), a Supplemental Distance plaque should be used with the ~~ROAD WORK AHEAD~~ SHOULDER WORK (W21-5) sign.

Option:

3. ~~The ROAD WORK NEXT XX km (MILES) sign may be used instead of the ROAD WORK AHEAD sign~~ The Next Distance (W7-3a) plaque may be used with the SHOULDER WORK (W21-5) sign if the work locations occur over a distance of more than 3.2 km (2 mi).
4. Warning signs may be omitted when the work vehicle displays high-intensity rotating, flashing, oscillating, or strobe lights if the distance between work locations is 1.6 km (1 mile) or more, and if the work vehicle travels at vehicular traffic speeds between locations.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

6. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
7. **If an arrow panel is used for an operation on the shoulder, the caution mode shall be used.**

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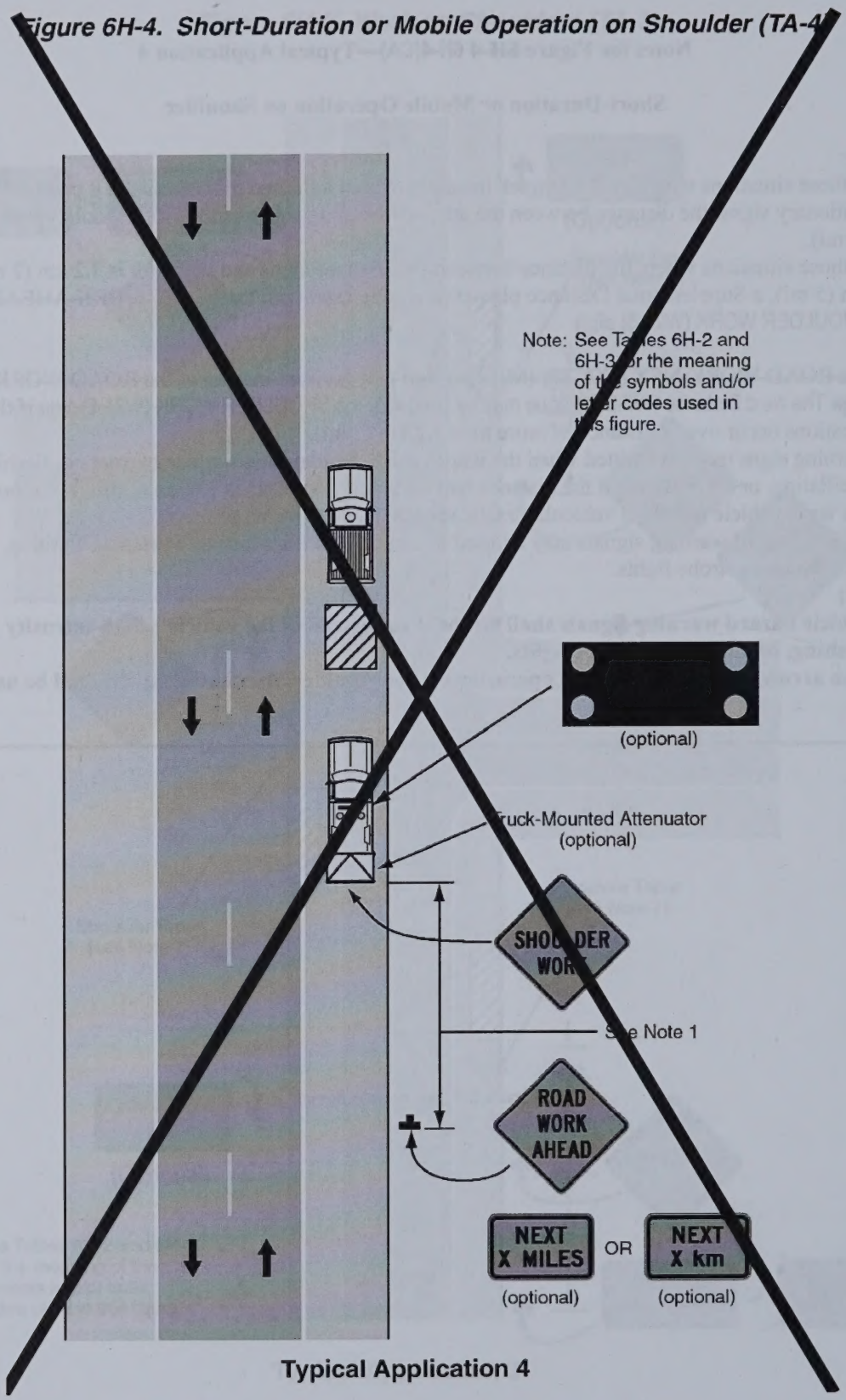
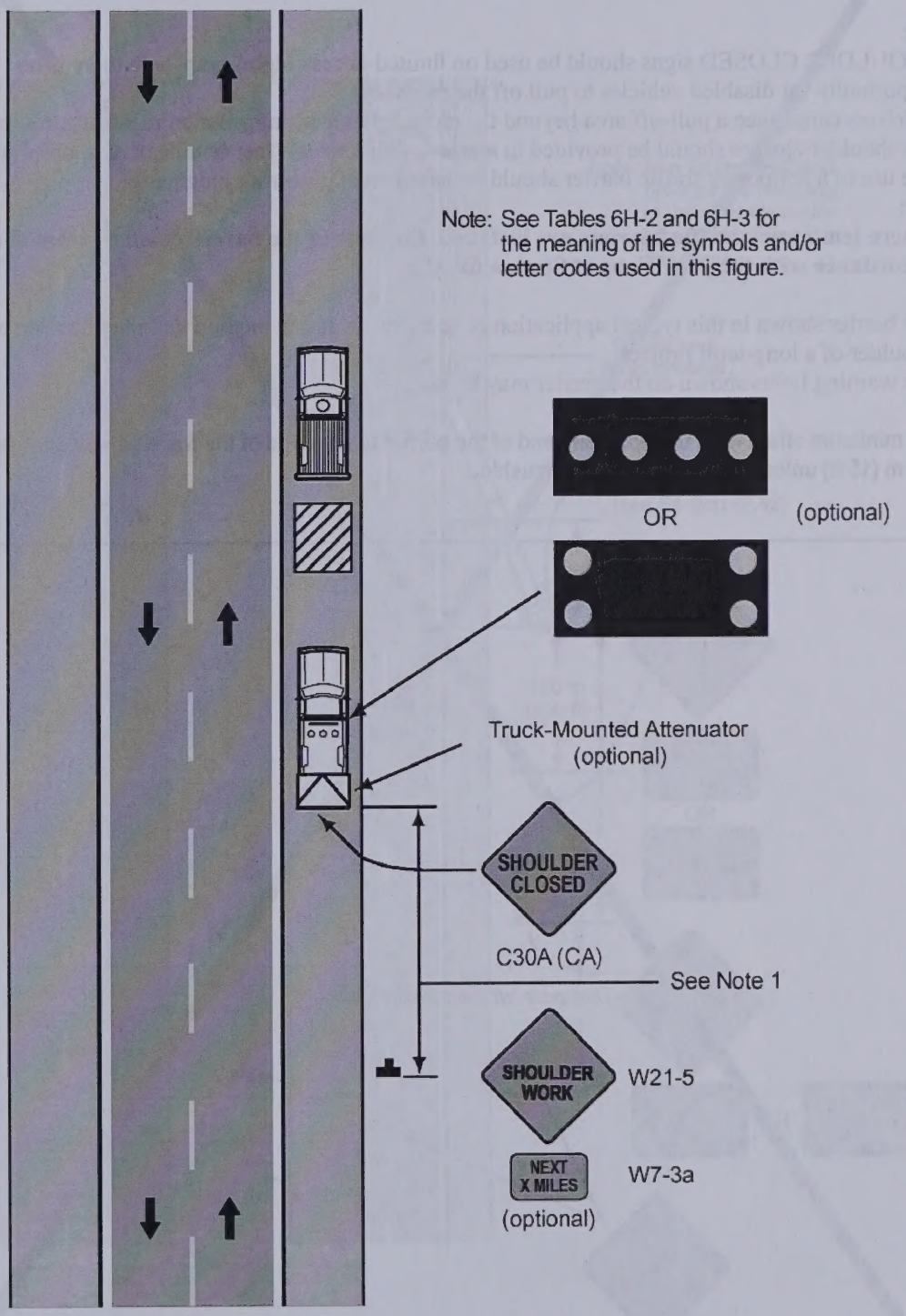
Figure 6H-4. Short-Duration or Mobile Operation on Shoulder (TA-4)



Typical Application 4

Figure 6H-4 (CA). Short-Duration or Mobile Operation on Shoulder (TA-4)



Typical Application 4

Notes for Figure ~~6H-5~~ 6H-5(CA)—Typical Application 5

Shoulder Closure on Freeway

Guidance:

1. SHOULDER CLOSED signs should be used on limited-access highways where there is no opportunity for disabled vehicles to pull off the roadway.
2. If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in ~~meters or kilometers~~ (feet or miles), as appropriate.
3. The use of a temporary traffic barrier should be based on engineering judgment.

Standard:

4. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.81.

Option:

5. The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a long-term project.
6. The warning lights shown on the barrier may be used.

Standard:

7. The minimum offset from the upstream end of the barrier to the edge of the traveled way shall be at least 4.6 m (15 ft) unless shielded by a crash cushion.

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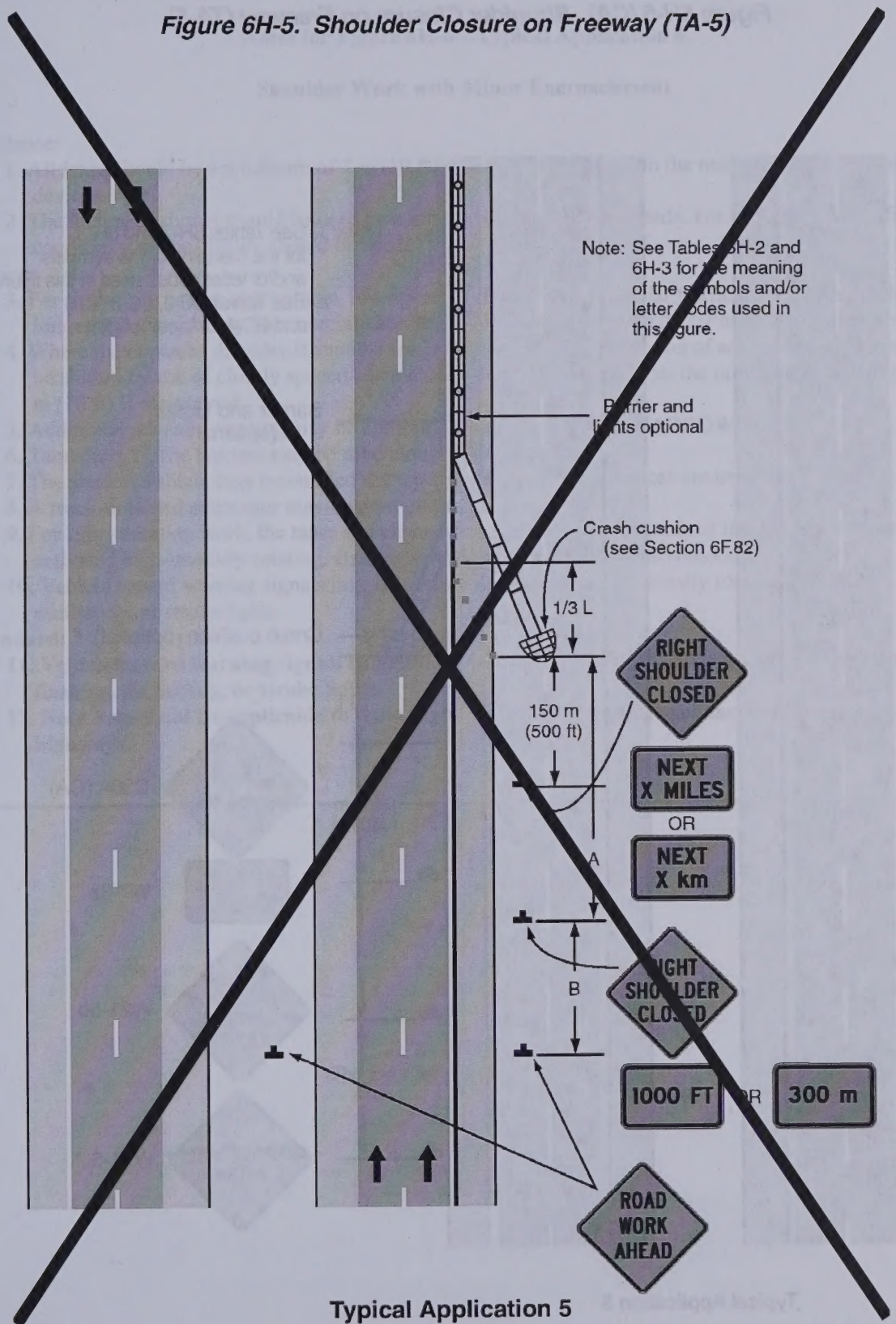
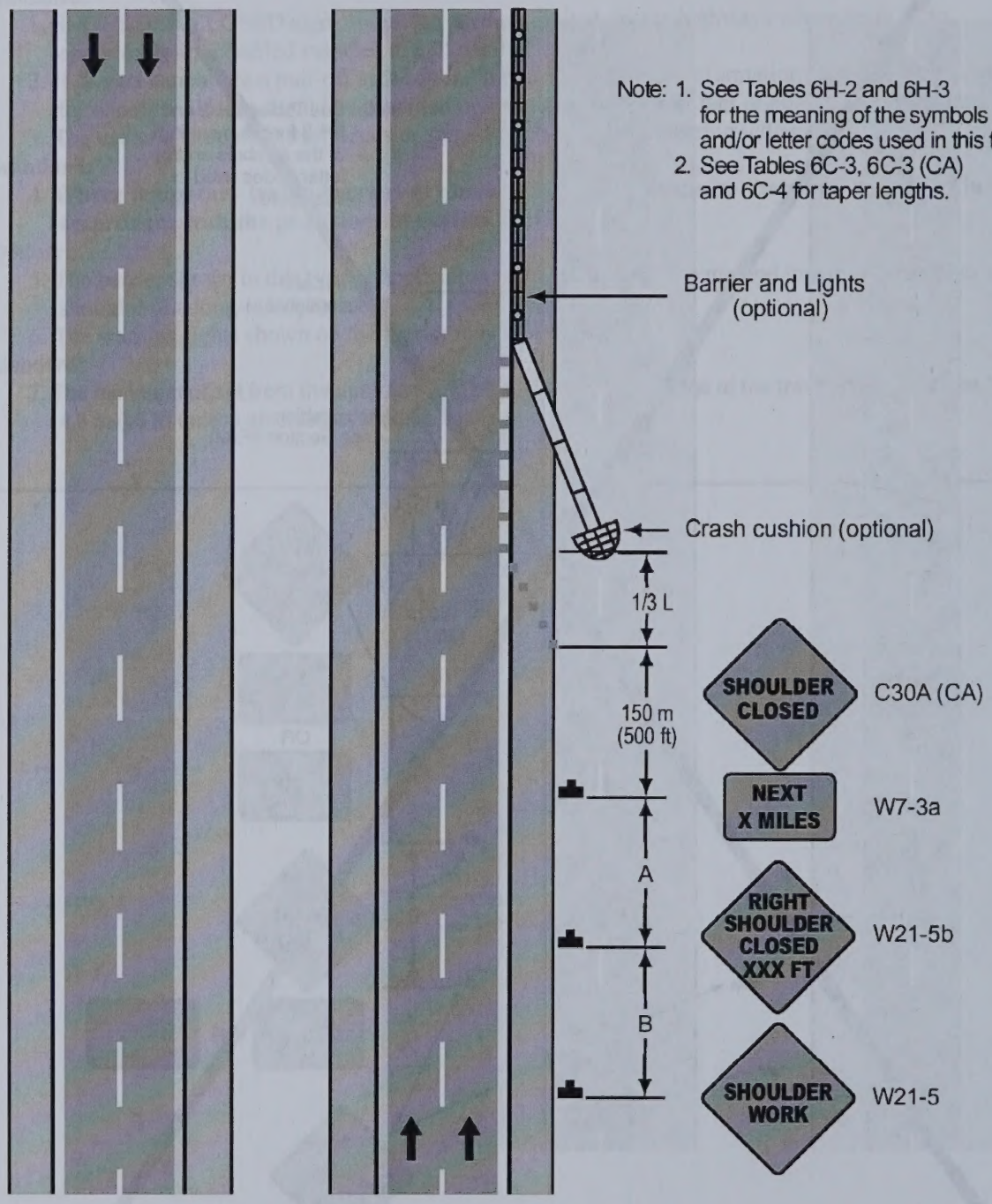
Figure 6H-5. Shoulder Closure on Freeway (TA-5)



Typical Application 5

Figure 6H-5 (CA). Shoulder Closure on Freeway (TA-5)



Typical Application 5

Notes for Figure 6H-6—Typical Application 6

Shoulder Work with Minor Encroachment

Guidance:

1. All lanes should be a minimum of 3 m (10 ft) in width as measured to the near face of the channelizing devices.
2. The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.

Option:

3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 2.7 m (9 ft) may be used.
4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely spaced channelizing devices, provided that the minimum lane width of 3 m (10 ft) is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if a taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

11. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

12. Note 3 shall not be applicable to State highways. Note 1 shall be used instead for State highways.

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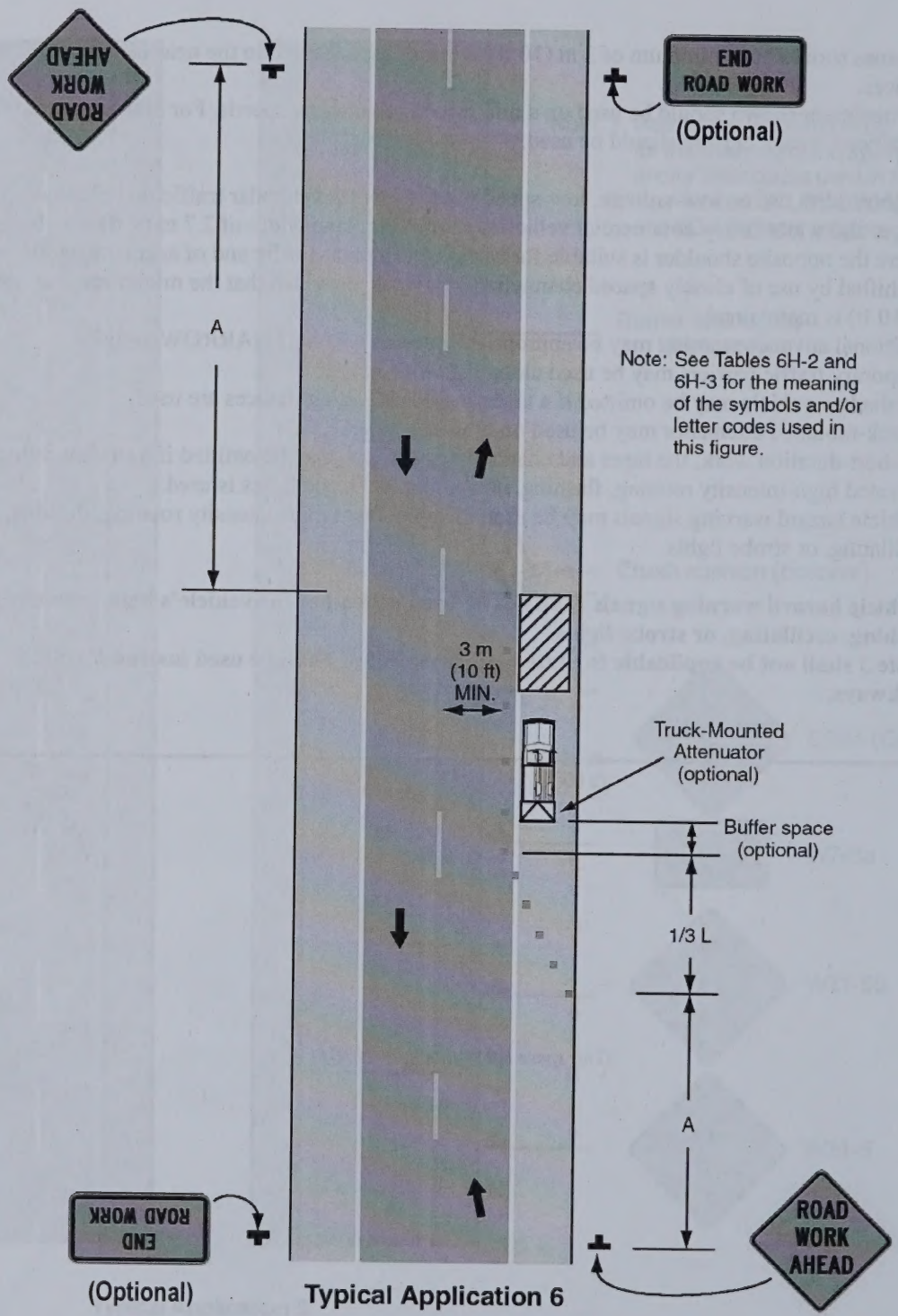
Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)



Notes for Figure ~~6H-7~~ 6H-7(CA)—Typical Application 7

Road Closure with Diversion

Support:

1. Signs and object markers are shown for one direction of travel only.

Standard:

2. Devices similar to those depicted shall be placed for the opposite direction of travel.

3. Pavement markings no longer applicable shall be removed or obliterated as soon as practicable.

4. Temporary barriers and end treatments shall be crashworthy.

Guidance:

5. If the tangent distance along the temporary diversion is more than 180 m (600 ft), a Reverse Curve sign, left first, should be used instead of the Double Reverse Curve sign, and a second Reverse Curve sign, right first, should be placed in advance of the second reverse curve back to the original alignment.
6. When the tangent section of the diversion is more than 180 m (600 ft), and the diversion has sharp curves with recommended speeds of 50 km/h (30 mph) or less, Reverse Turn signs should be used.
7. Where the temporary pavement and old pavement are different colors, the temporary pavement should start on the tangent of the existing pavement and end on the tangent of the existing pavement.

Option:

8. Flashing warning lights and/or flags may be used to call attention to the warning signs.
9. On sharp curves, large arrow signs may be used in addition to other advance warning signs.
10. Delineators or channelizing devices may be used along the diversion.
11. If the tangent distance along the temporary diversion is less than 180 m (600 ft), additional One-Direction Large Arrow (W1-6) and Chevron Alignment (W1-8) signs may be used.
12. When recommended speeds are the same for each curve, one Double Reverse Curve (W24-1) sign may be used, instead of two Reverse Curve (W1-4) signs, in advance of the first curve.

Support:

13. Use crash cushions, wherever applicable.

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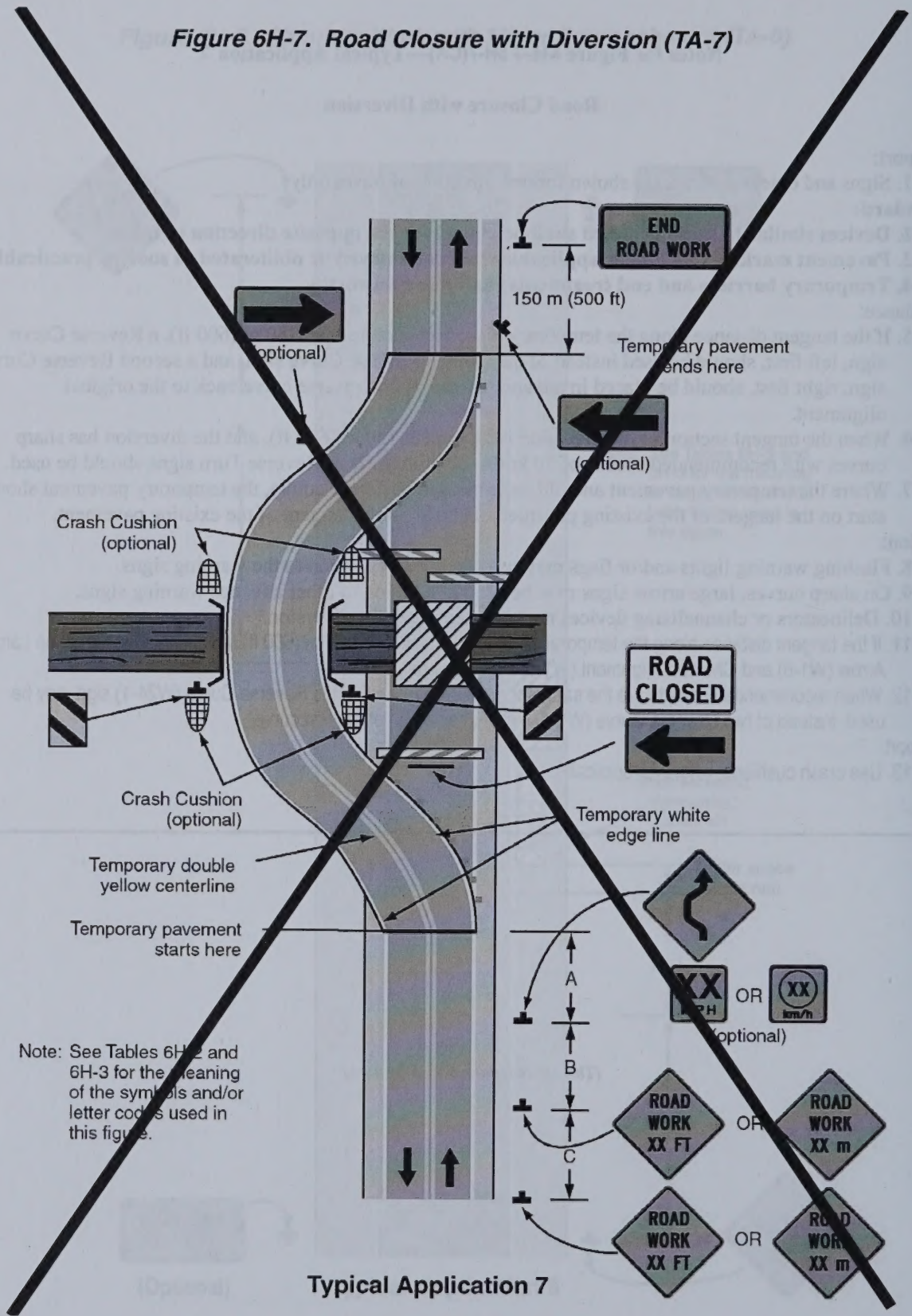
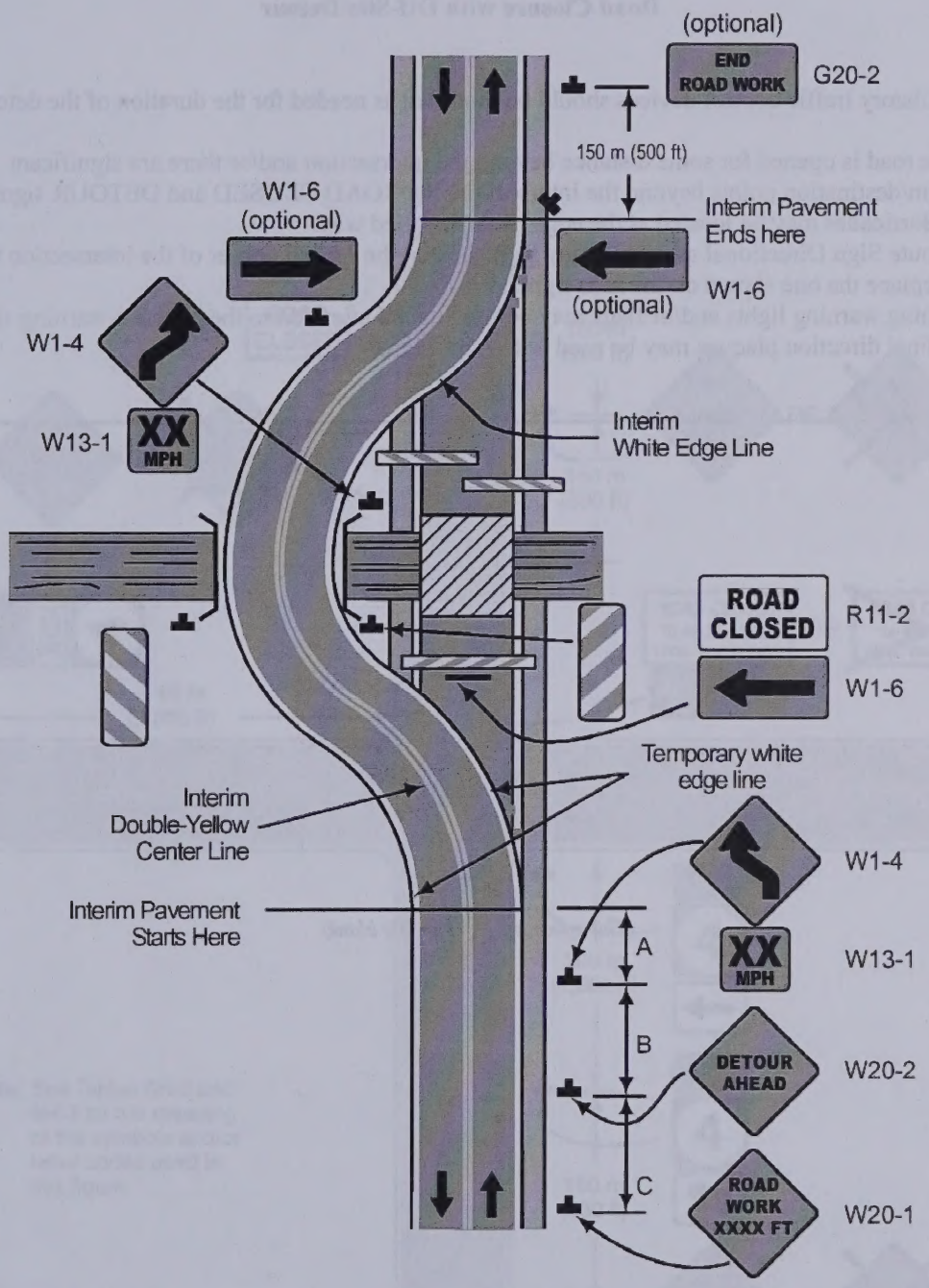
Figure 6H-7. Road Closure with Diversion (TA-7)



Typical Application 7

Figure 6H-7 (CA). Road Closure with Diversion (TA-7)



Typical Application 7

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Notes for Figure 6H-8—Typical Application 8

Road Closure with Off-Site Detour

Guidance:

1. Regulatory traffic control devices should be modified as needed for the duration of the detour.

Option:

2. If the road is opened for some distance beyond the intersection and/or there are significant origin/destination points beyond the intersection, the ROAD CLOSED and DETOUR signs on Type III Barricades may be located at the edge of the traveled way.
3. A Route Sign Directional assembly may be placed on the far left corner of the intersection to augment or replace the one shown on the near right corner.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Cardinal direction plaques may be used with route signs.

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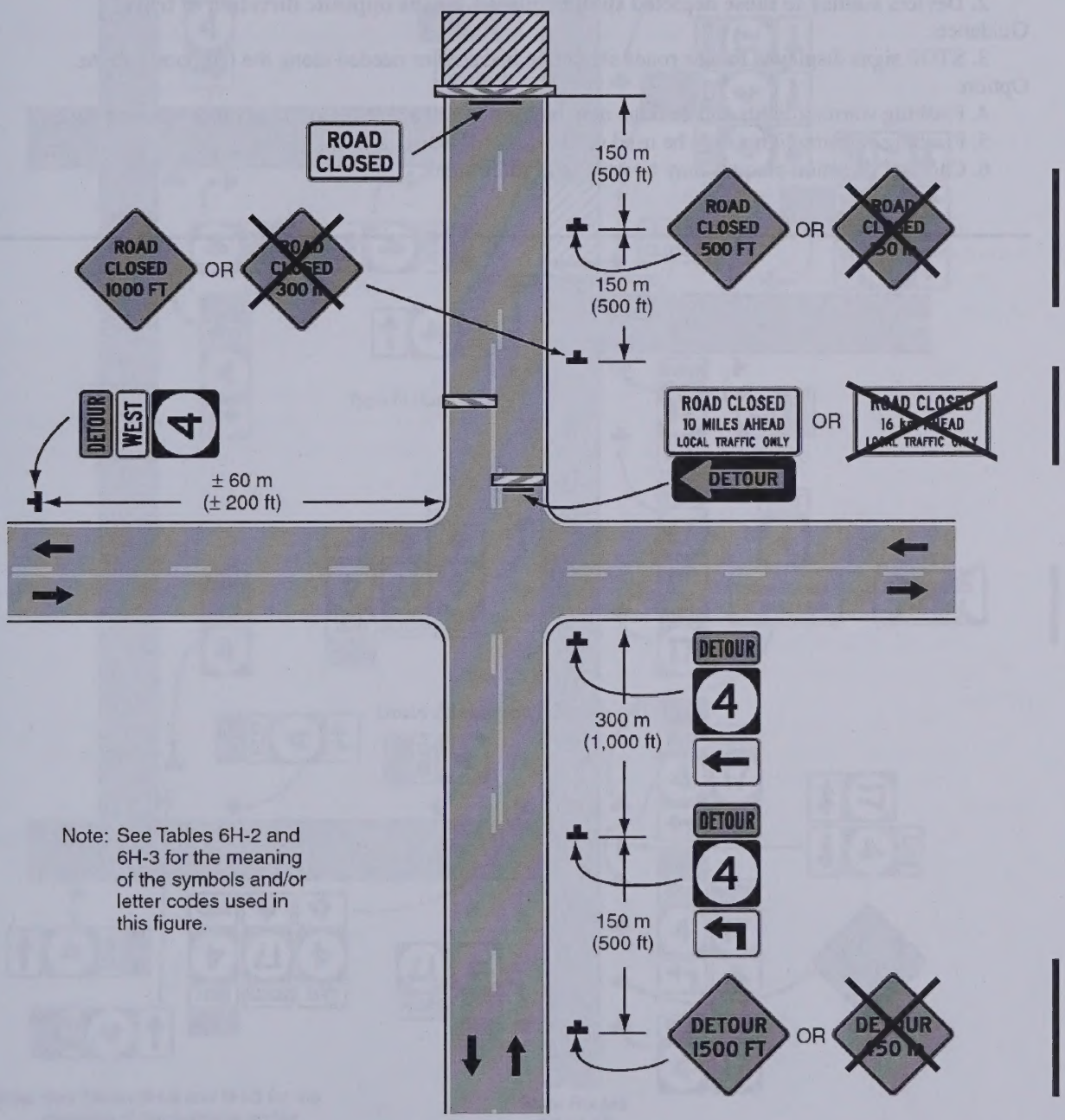
Figure 6H-8. Road Closure with Off-Site Detour (TA-8)



Typical Application 8

Notes for Figure 6H-9—Typical Application 9

Overlapping Routes with Detour

Support:

1. TTC devices are shown for one direction of travel only.

Standard:

2. Devices similar to those depicted shall be placed for the opposite direction of travel.

Guidance:

3. STOP signs displayed to side roads should be installed as needed along the temporary route.

Option:

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Flashing warning lights may be used on the Type III Barricades.
6. Cardinal direction plaques may be used with route signs.

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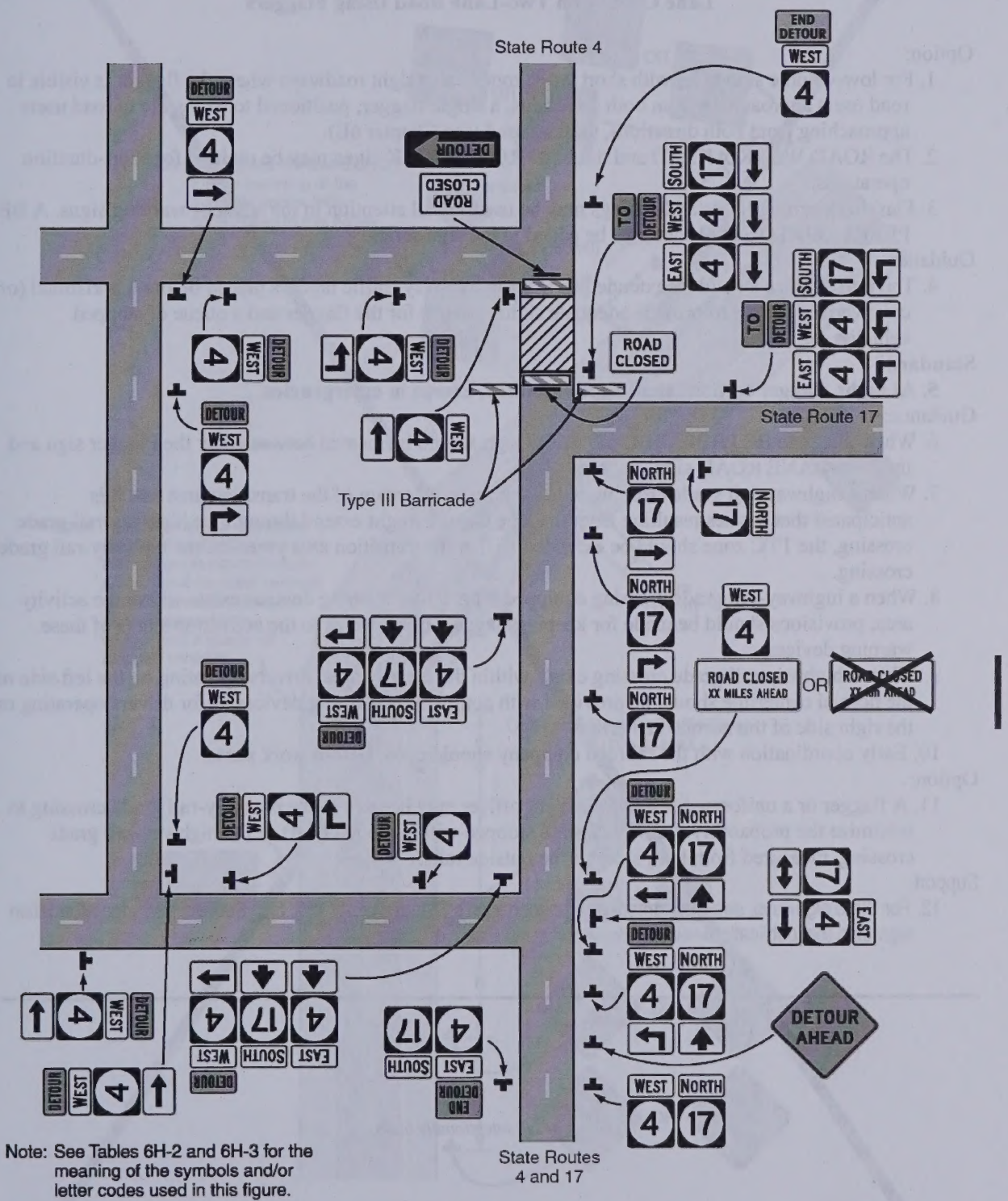
Figure 6H-9. Overlapping Routes with Detour (TA-9)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 9

Notes for Figure ~~6H-10~~ 6H-10(CA)—Typical Application 10

Lane Closure on Two-Lane Road Using Flaggers

Option:

1. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).
2. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

4. The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.

Standard:

5. At night, flagger stations shall be illuminated, except in emergencies.

Guidance:

6. When used, the BE PREPARED TO STOP sign should be located ~~between~~ after the Flagger sign and the ONE LANE ROAD sign.
7. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the transition area precedes the highway-rail grade crossing.
8. When a highway-rail grade crossing equipped with active warning devices exists within the activity area, provisions should be made for keeping flaggers informed as to the activation status of these warning devices.
9. When a highway-rail grade crossing exists within the activity area, drivers operating on the left side of the normal centerline should be provided with comparable warning devices as for drivers operating on the right side of the normal centerline.
10. Early coordination with the railroad company should occur before work starts.

Option:

11. A flagger or a uniformed law enforcement officer may be used at the highway-rail grade crossing to minimize the probability that vehicles are stopped within 4.6 m (15 ft) of the highway-rail grade crossing, measured from both sides of the outside rails.

Support:

12. For State highways, see Department of Transportation's Standard Plan T13. See Section 1A.11 for information regarding this publication.

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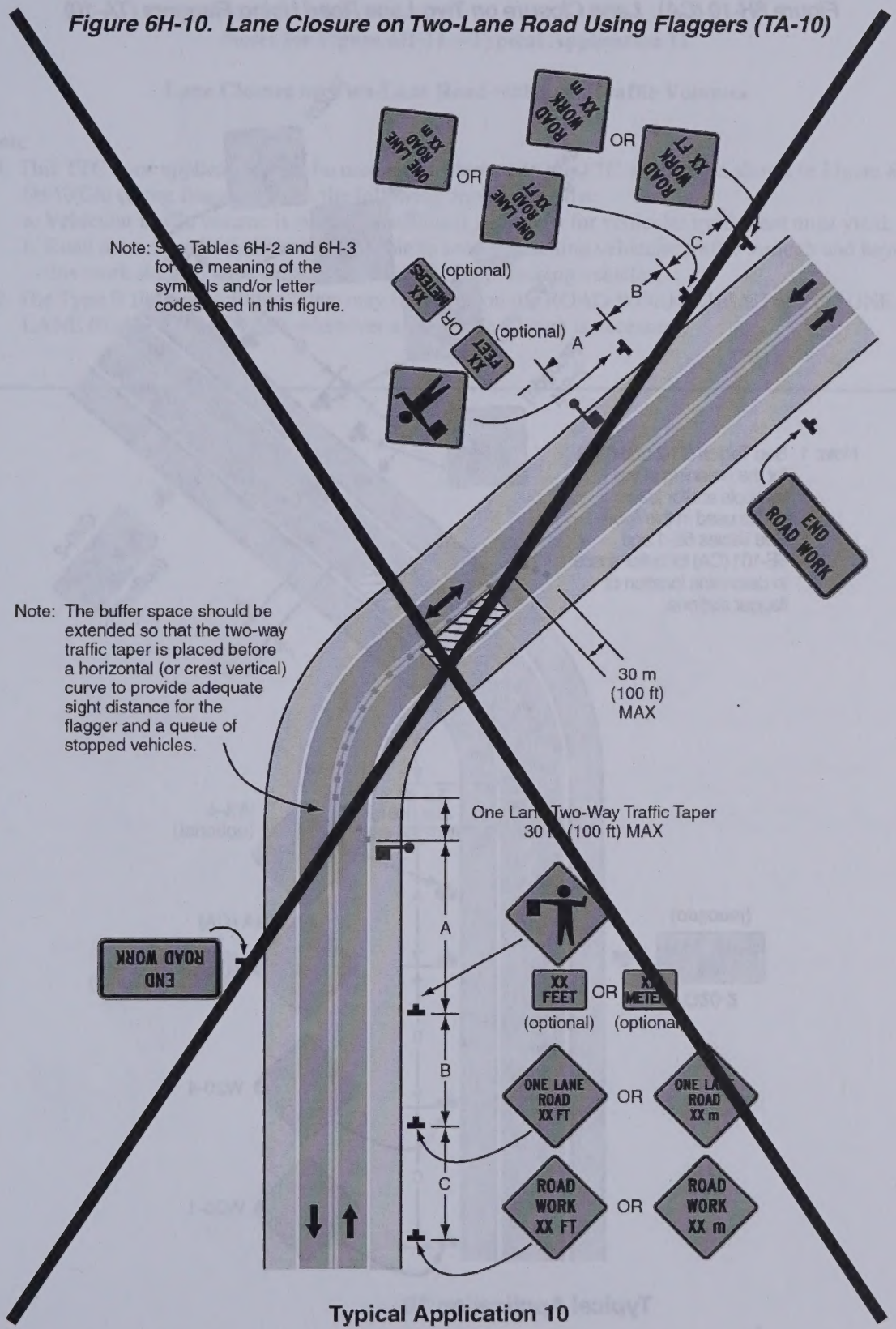
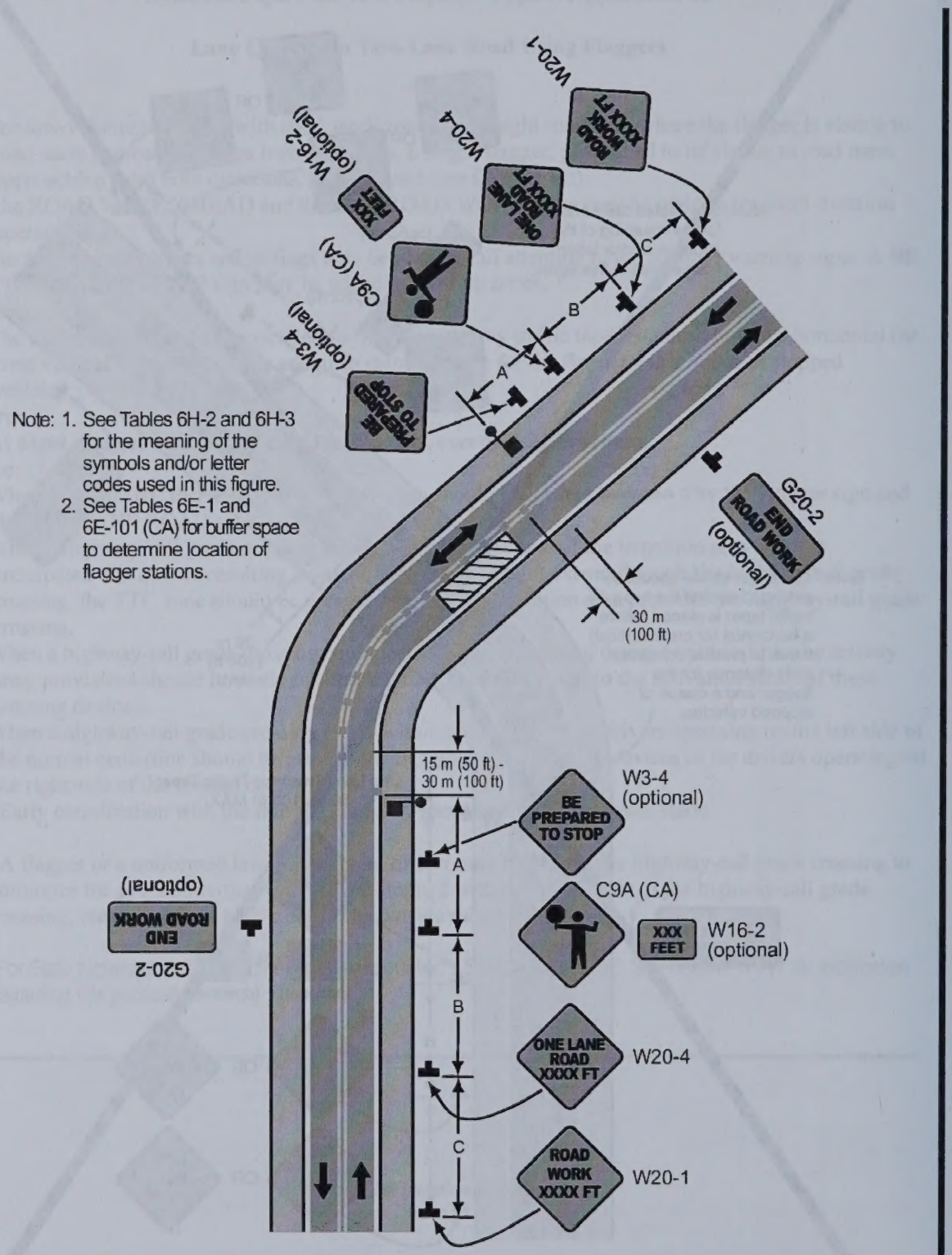
Figure 6H-10. Lane Closure on Two-Lane Road Using Flaggers (TA-10)



Typical Application 10

Figure 6H-10 (CA). Lane Closure on Two-Lane Road Using Flaggers (TA-10)



Typical Application 10

Notes for Figure 6H-11—Typical Application 11

Lane Closure on Two-Lane Road with Low Traffic Volumes

Option:

1. This TTC zone application may be used as an alternate to the TTC application shown in Figure ~~6H-10~~ 6H-10(CA) (using flaggers) when the following conditions exist:
   a. Vehicular traffic volume is such that sufficient gaps exist for vehicular traffic that must yield.
   b. Road users from both directions are able to see approaching vehicular traffic through and beyond the work site and have sufficient visibility of approaching vehicles.
2. The Type B flashing warning lights may be placed on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs whenever a night lane closure is necessary.

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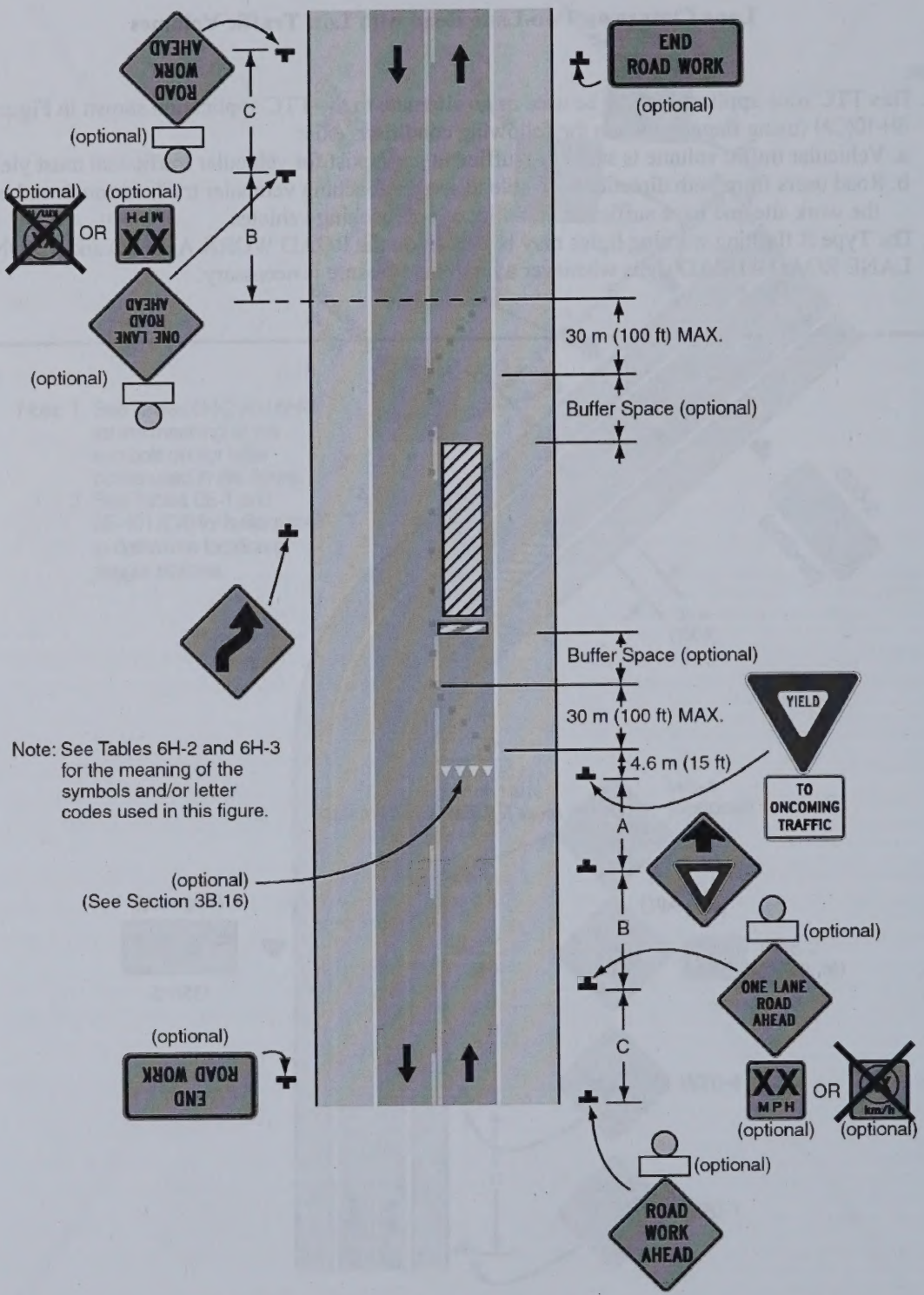
Figure 6H-11. Lane Closure on Two-Lane Road with Low Traffic Volumes



Typical Application 11

Notes for Figure ~~6H-12~~ 6H-12(CA)—Typical Application 12

Lane Closure on Two-Lane Road Using Traffic Control Signals

Standard:

1. **TTC signals shall be installed and operated in accordance with the provisions of Part 4. TTC signals shall meet the physical display and operational requirements of conventional traffic control signals.**
2. **TTC signal timing shall be established by authorized officials. Durations of red clearance intervals shall be adequate to clear the one-lane section of conflicting vehicles.**
3. **When the TTC signal is changed to the flashing mode, either manually or automatically, red signal indications shall be flashed to both approaches.**
4. **Stop lines shall be installed with TTC signals for intermediate and long-term closures. Existing conflicting pavement markings and raised pavement marker reflectors between the activity area and the stop line shall be removed. After the TTC signal is removed, the stop lines and other temporary pavement markings shall be removed and the permanent pavement markings restored.**
5. **Safeguards shall be incorporated to avoid the possibility of conflicting signal indications at each end of the TTC zone.**

Guidance:

6. Where no-passing lines are not already in place, they should be added.
7. Adjustments in the location of the advance warning signs should be made as needed to accommodate the horizontal or vertical alignment of the roadway, recognizing that the distances shown for sign spacings are minimums. Adjustments in the height of the signal heads should be made as needed to conform to the vertical alignment.

Option:

8. Flashing warning lights shown on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs may be used.
9. Removable pavement markings may be used.

Support:

10. TTC signals are preferable to flaggers for long-term projects and other activities that would require flagging at night.
11. The maximum length of activity area for one-way operation under TTC signal control is determined by the capacity required to handle the peak demand.

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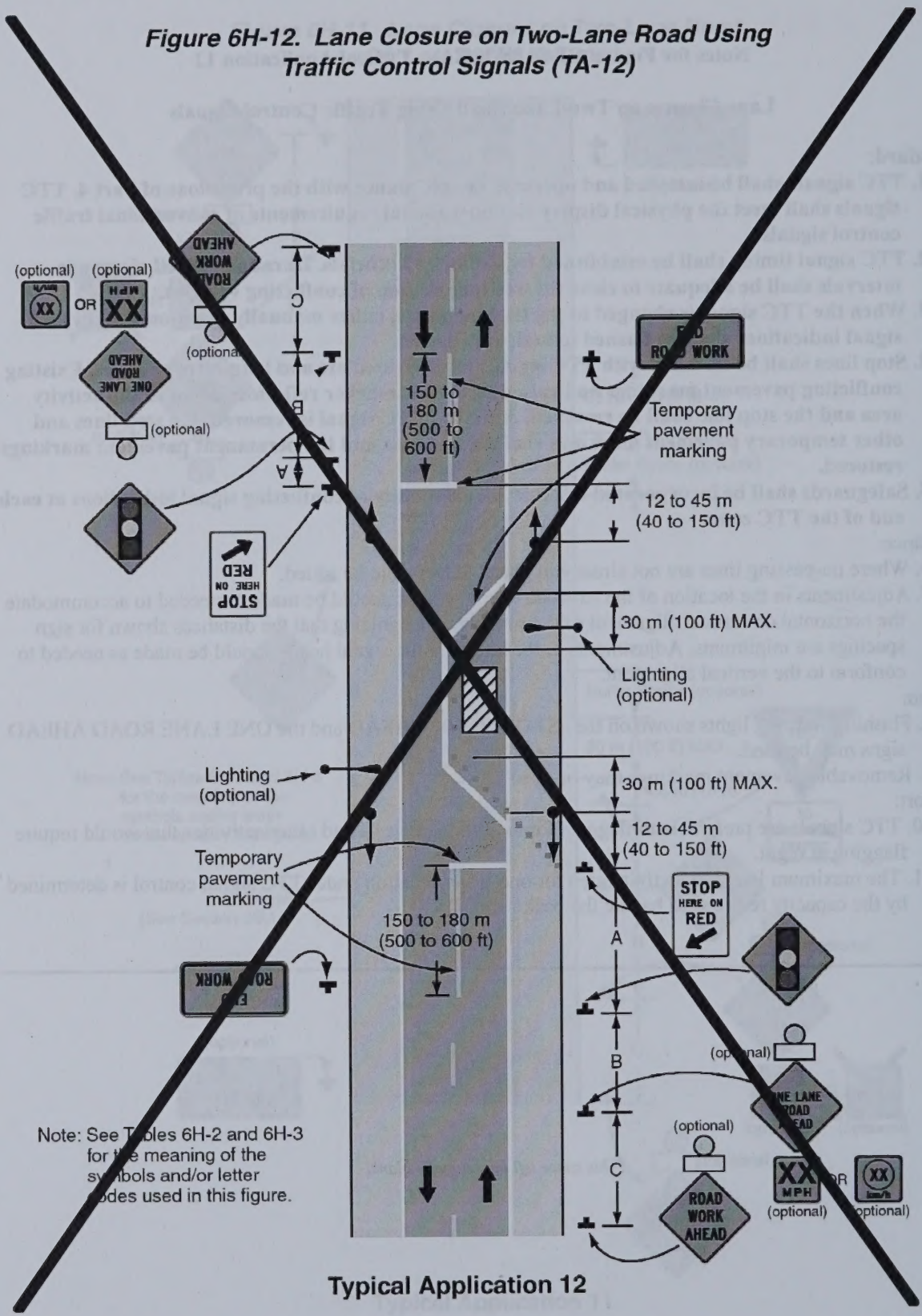
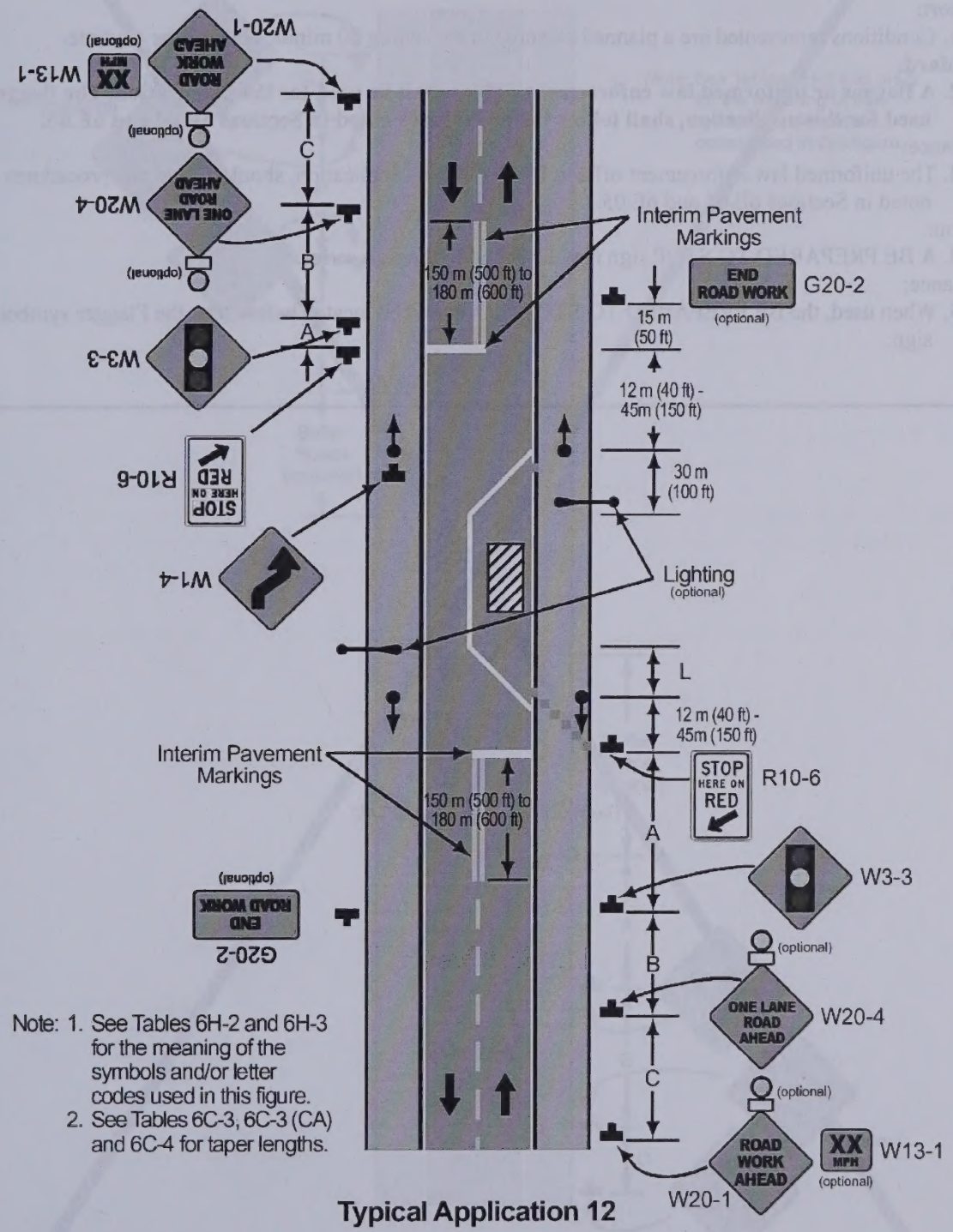
Figure 6H-12. Lane Closure on Two-Lane Road Using Traffic Control Signals (TA-12)



Typical Application 12

Figure 6H-12 (CA). Lane Closure on Two-Lane Road Using Traffic Control Signals (TA-12)



Note: 1. See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
2. See Tables 6C-3, 6C-3 (CA) and 6C-4 for taper lengths.

Typical Application 12

Notes for Figure ~~6H-13~~ 6H-13(CA)—Typical Application 13

Temporary Road Closure

Support:

1. Conditions represented are a planned closure not exceeding 20 minutes during the daytime.

Standard:

2. A flagger or uniformed law enforcement officer shall be used for this application. The flagger, if used for this application, shall follow the procedures noted in Sections 6E.04 and 6E.05.

Guidance:

3. The uniformed law enforcement officer, if used for this application, should follow the procedures noted in Sections 6E.04 and 6E.05.

Option:

4. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

5. When used, the BE PREPARED TO STOP sign should be located ~~before~~ after the Flagger symbol sign.

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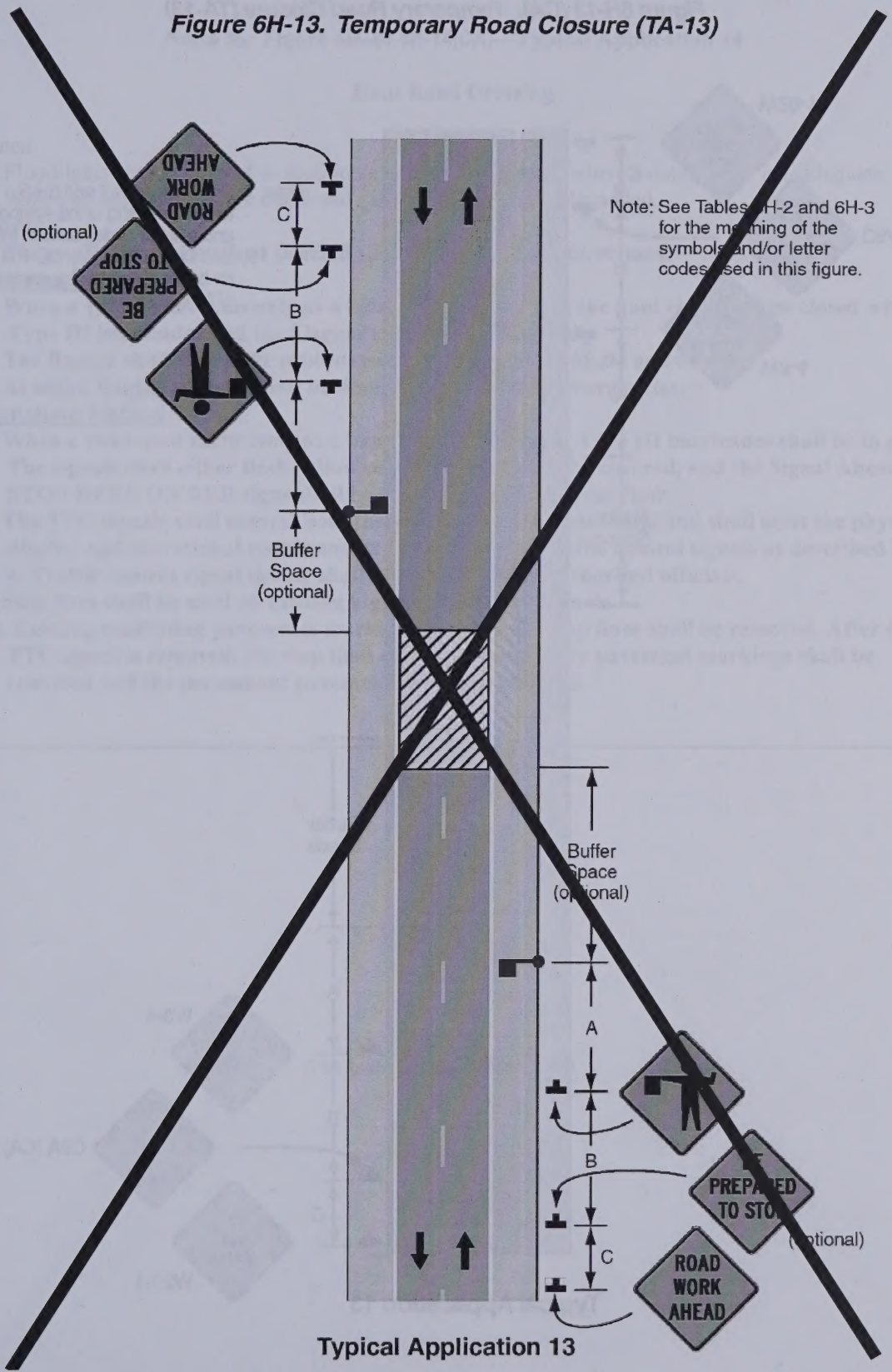
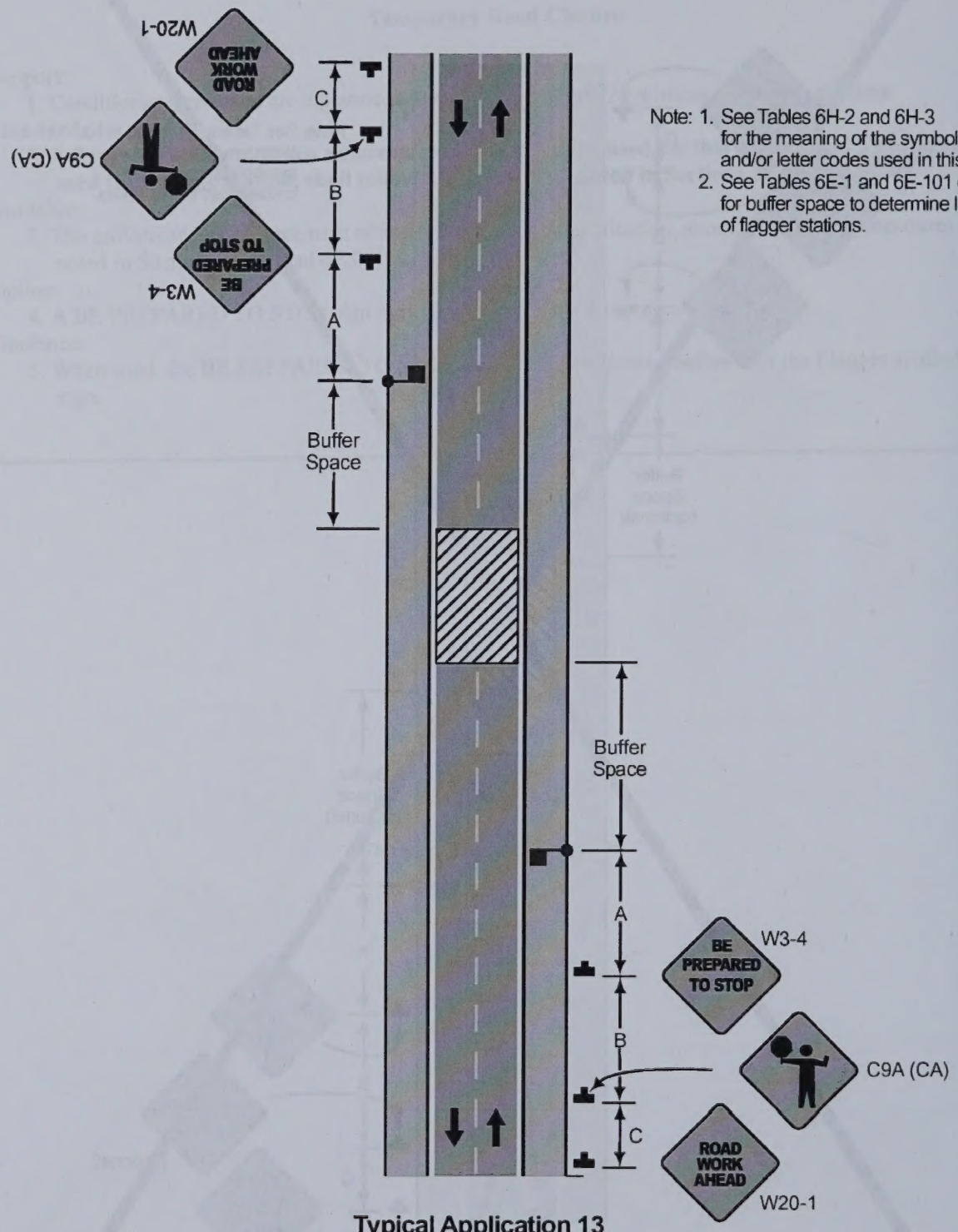
Figure 6H-13. Temporary Road Closure (TA-13)



Typical Application 13

Figure 6H-13 (CA). Temporary Road Closure (TA-13)



Typical Application 13

Notes for Figure ~~6H-14~~ 6H-14(CA)—Typical Application 14

Haul Road Crossing

Guidance:

1. Floodlights should be used to illuminate haul road crossings where existing light is inadequate.
2. Where no passing lines are not already in place, they should be added.

Standard:

3. The traffic control method selected shall be used in both directions.

Flagging Method

4. When a road used exclusively as a haul road is not in use, the haul road shall be closed with Type III barricades and the Flagger symbol signs covered.

5. The flagger shall follow the procedures noted in Sections 6E.04 and 6E.05.

6. At night, flagger stations shall be illuminated, except in emergencies.

Signalized Method

7. When a road used exclusively as a haul road is not in use, Type III barricades shall be in place. The signals shall either flash yellow on the main road or be covered, and the Signal Ahead and STOP HERE ON RED signs shall be covered or hidden from view.

8. The TTC signals shall control both the highway and the haul road and shall meet the physical display and operational requirements of conventional traffic control signals as described in Part 4. Traffic control signal timing shall be established by authorized officials.

9. Stop lines shall be used on existing highway with TTC signals.

10. Existing conflicting pavements markings between the stop lines shall be removed. After the TTC signal is removed, the stop lines and other temporary pavement markings shall be removed and the permanent pavement markings restored.

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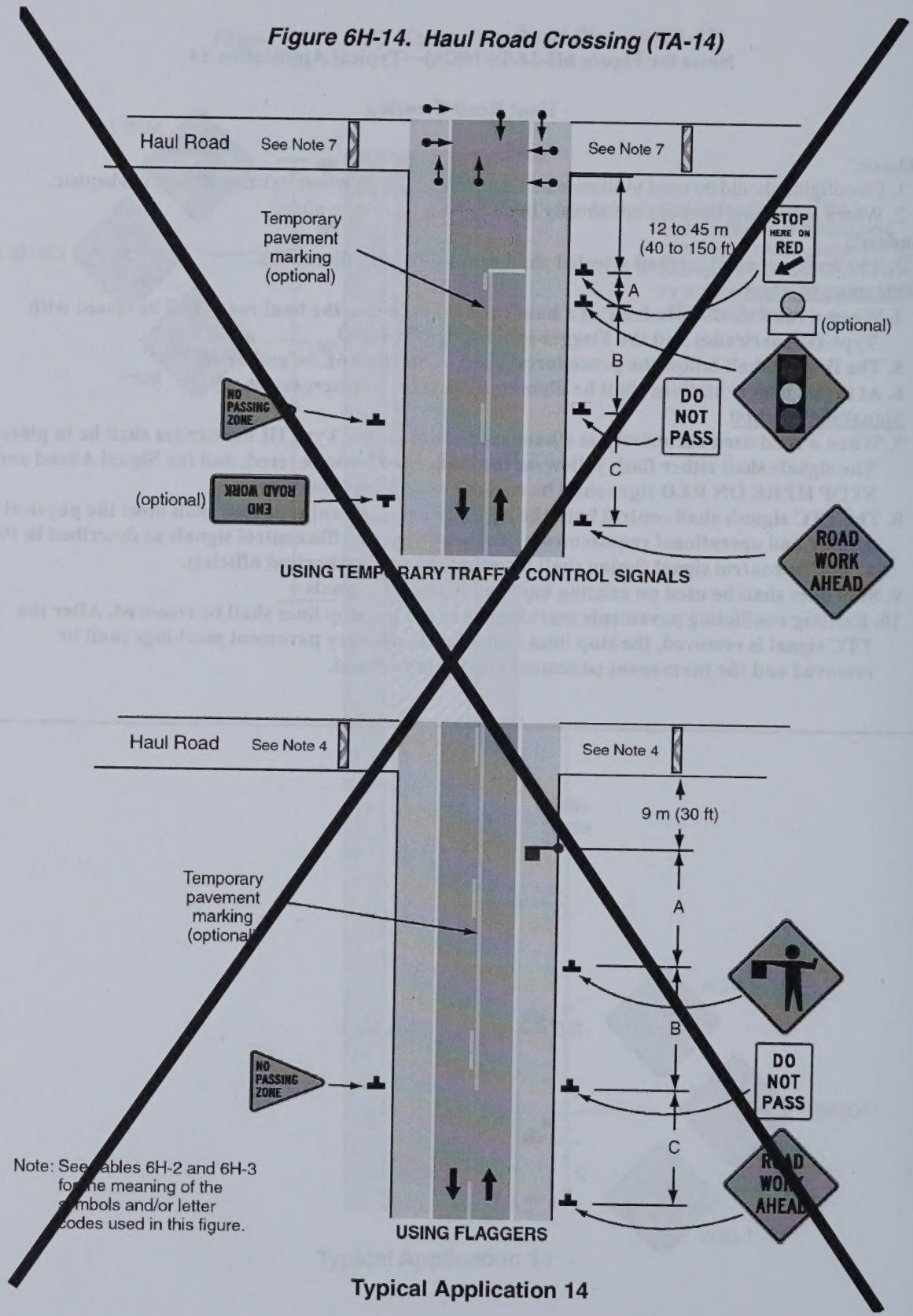
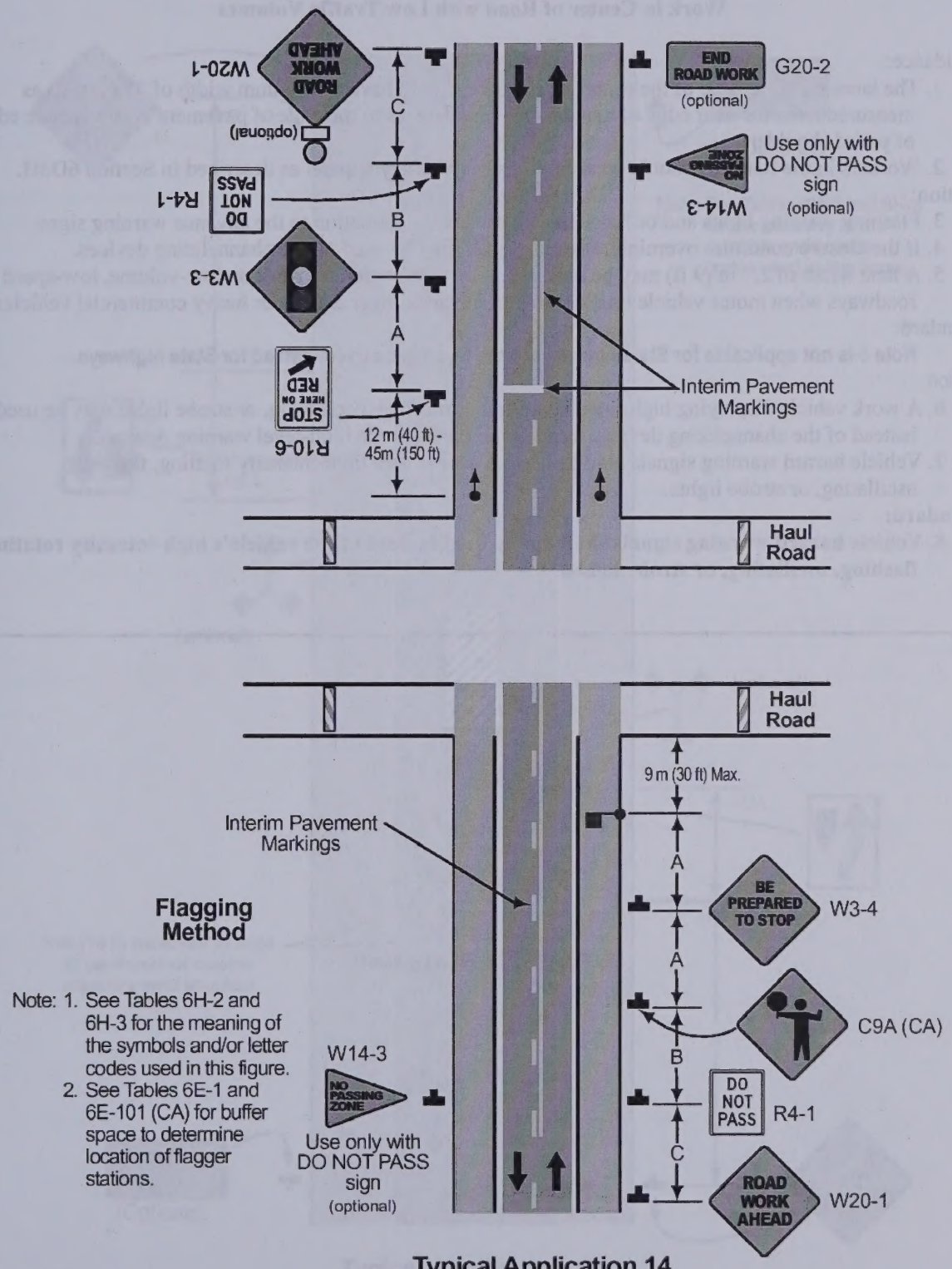
Figure 6H-14. Haul Road Crossing (TA-14)



Typical Application 14

Figure 6H-14 (CA). Haul Road Crossing (TA-14)



Note: 1. See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
2. See Tables 6E-1 and 6E-101 (CA) for buffer space to determine location of flagger stations.

Typical Application 14

Notes for Figure 6H-15—Typical Application 15

Work in Center of Road with Low Traffic Volumes

Guidance:

1. The lanes on either side of the center work space should have a minimum width of 3 m (10 ft) as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.
2. Workers in the roadway should wear high-visibility safety apparel as described in Section 6D.03.

Option:

3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
4. If the closure continues overnight, warning lights may be used on the channelizing devices.
5. A lane width of 2.7 m (9 ft) may be used for short-term stationary work on low-volume, low-speed roadways when motor vehicle traffic does not include longer and wider heavy commercial vehicles.

Standard:

Note 5 is not applicable for State highways. Note #1 shall be used instead for State highways.

Option:

6. A work vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights may be used instead of the channelizing devices forming the tapers or the high-level warning devices.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

8. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

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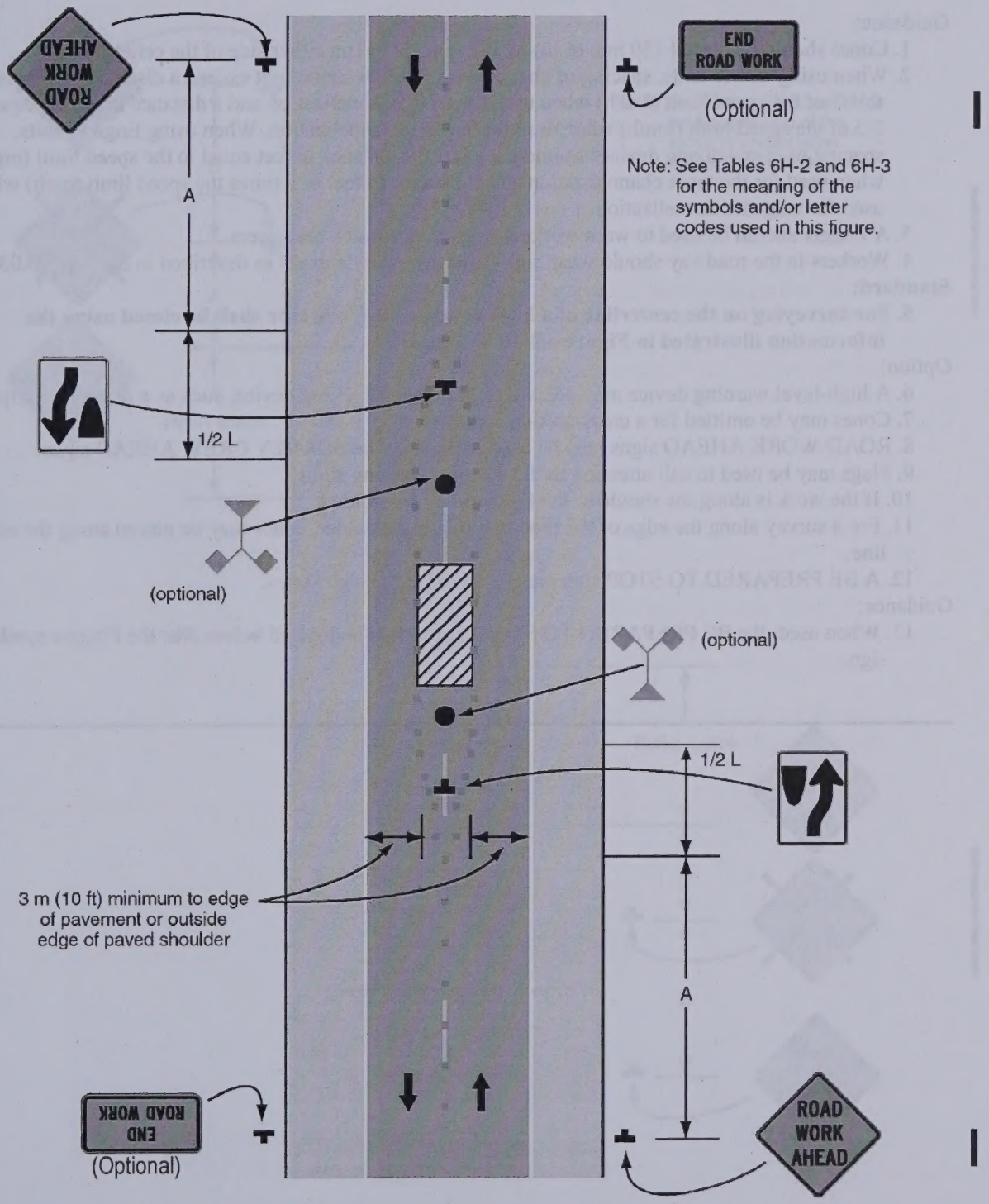
Figure 6H-15. Work in Center of Road with Low Traffic Volumes (TA-15)


ROAD WORK AHEAD
END ROAD WORK
(Optional)
Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
A
1/2 L
(optional)
(optional)
1/2 L
3 m (10 ft) minimum to edge of pavement or outside edge of paved shoulder
A
END ROAD WORK
(Optional)
ROAD WORK AHEAD

Typical Application 15

Notes for Figure 6H-16—Typical Application 16

Surveying Along Centerline of Road with Low Traffic Volumes

Guidance:

1. Cones should be placed 150 mm (6 in) to 300 mm (12 in) on either side of the centerline.
2. When using metric units, spacing of channelizing devices should not exceed a distance in meters equal to 1/5 of the speed limit (km/h) when used for taper channelization and a distance in meters equal to 2/5 of the speed limit (km/h) when used for tangent channelization. When using English units, spacing of channelizing devices should not exceed a distance in feet equal to the speed limit (mph) when used for the taper channelization and a distance in feet of 2 times the speed limit (mph) when used for tangent channelization.
3. A flagger should be used to warn workers who cannot watch road users.
4. Workers in the roadway should wear high-visibility safety apparel as described in Section 6D.03.

Standard:

5. For surveying on the centerline of a high-volume road, one lane shall be closed using the information illustrated in Figure ~~6H-10~~ 6H-10(CA).

Option:

6. A high-level warning device may be used to protect a surveying device, such as a target on a tripod.
7. Cones may be omitted for a cross-section survey.
8. ROAD WORK AHEAD signs may be used in place of the SURVEY CREW AHEAD signs.
9. Flags may be used to call attention to the advance warning signs.
10. If the work is along the shoulder, the flagger may be omitted.
11. For a survey along the edge of the road or along the shoulder, cones may be placed along the edge line.
12. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

13. When used, the BE PREPARED TO STOP sign should be located ~~before~~ after the Flagger symbol sign.

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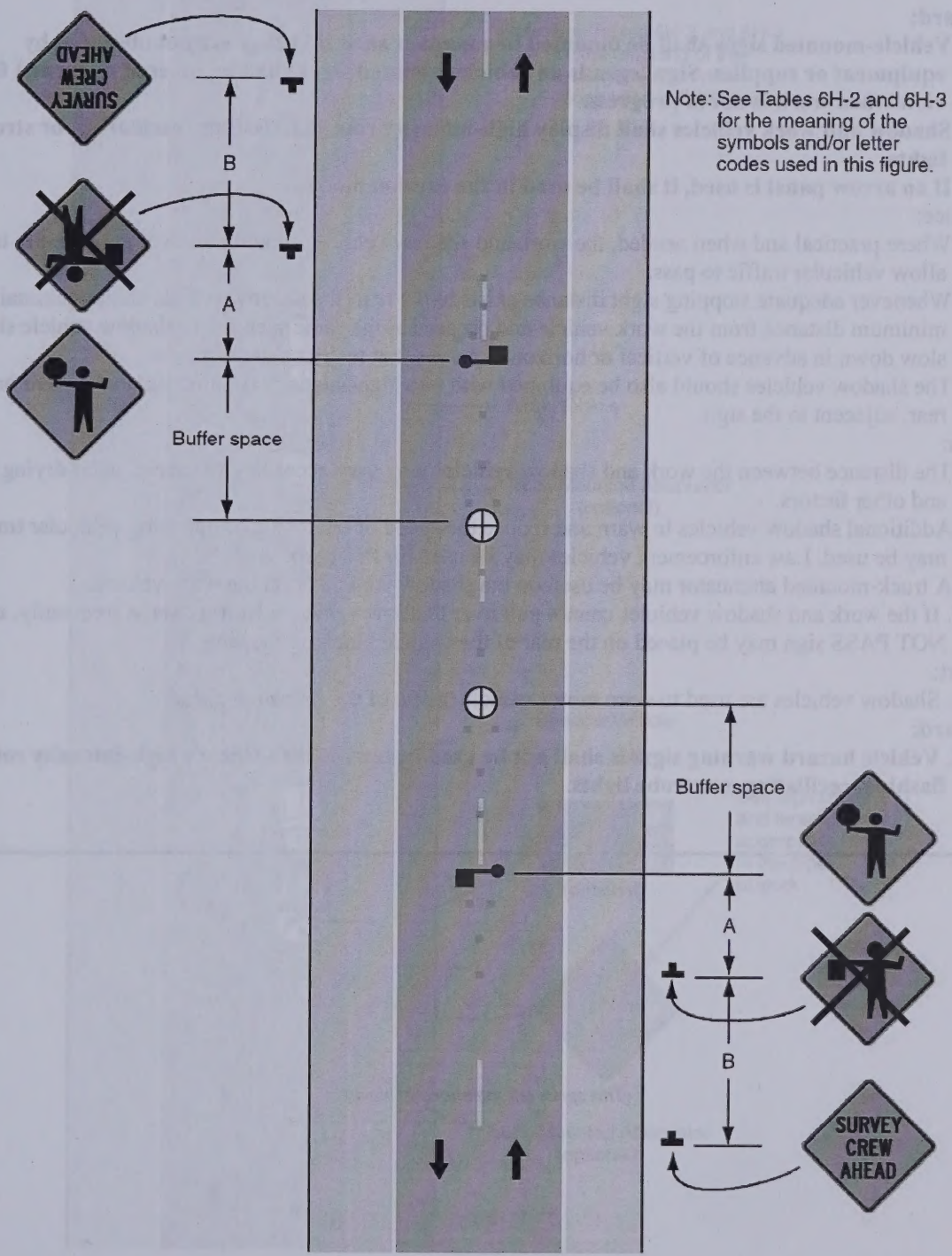
Figure 6H-16. Surveying Along Centerline of Road with Low Traffic Volumes (TA-16)



Typical Application 16

Notes for Figure 6H-17—Typical Application 17

Mobile Operations on Two-Lane Road

Standard:

1. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

2. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.

3. If an arrow panel is used, it shall be used in the caution mode.

Guidance:

4. Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.
5. Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.
6. The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.

Option:

7. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
8. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
9. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
10. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

Support:

11. Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

Standard:

12. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

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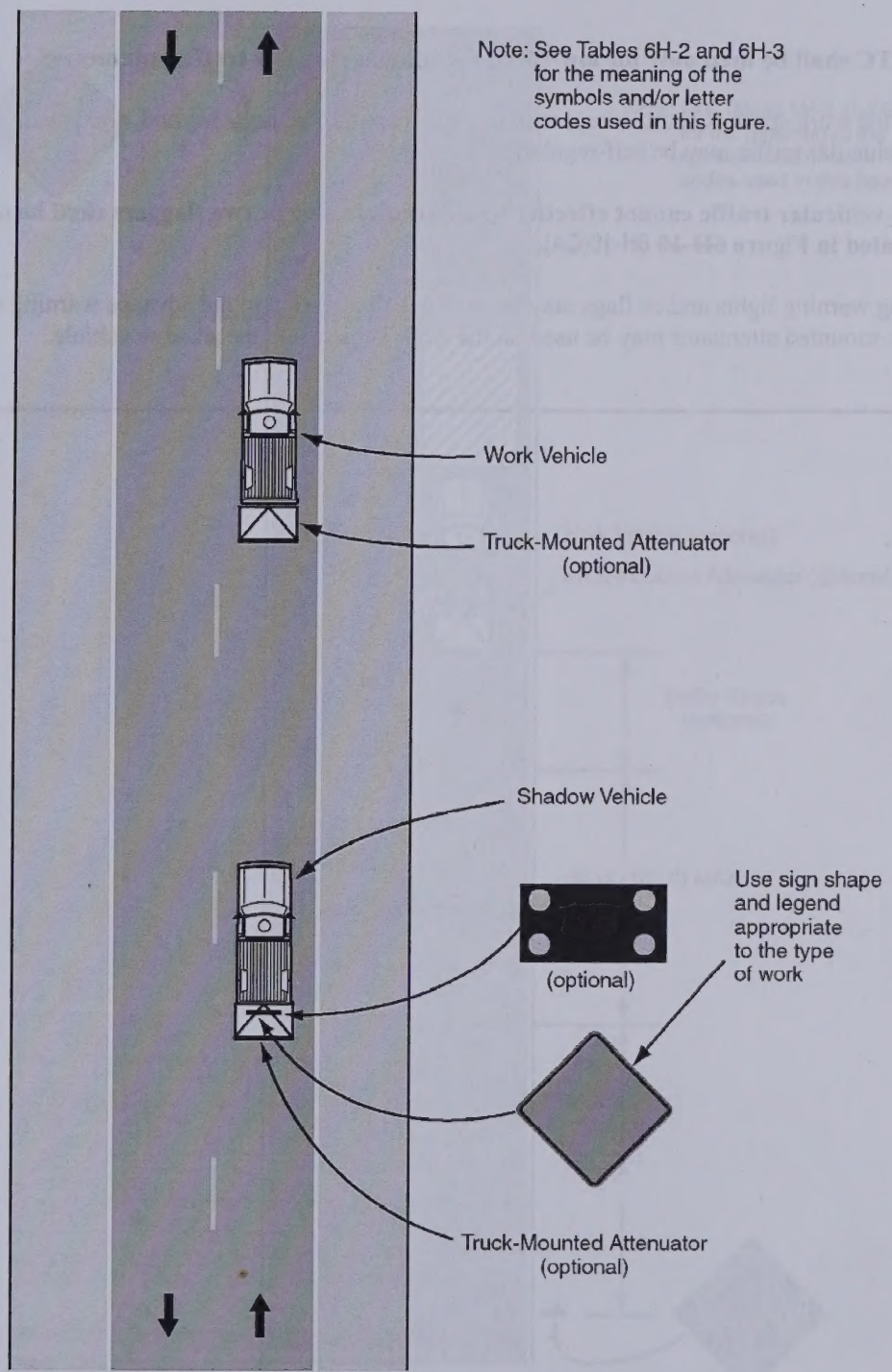
Figure 6H-17. Mobile Operations on Two-Lane Road (TA-17)


Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
Work Vehicle
Truck-Mounted Attenuator (optional)
Shadow Vehicle
(optional)
Use sign shape and legend appropriate to the type of work
Truck-Mounted Attenuator (optional)

Typical Application 17

Notes for Figure 6H-18—Typical Application 18

Lane Closure on Minor Street

Standard:

1. This TTC shall be used only for low-speed facilities having low traffic volumes.

Option:

2. Where the work space is short, where road users can see the roadway beyond, and where volume is low, vehicular traffic may be self-regulating.

Standard:

3. Where vehicular traffic cannot effectively self-regulate, one or two flaggers shall be used as illustrated in Figure ~~6H-10~~ 6H-10(CA).

Option:

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A truck-mounted attenuator may be used on the work vehicle and the shadow vehicle.

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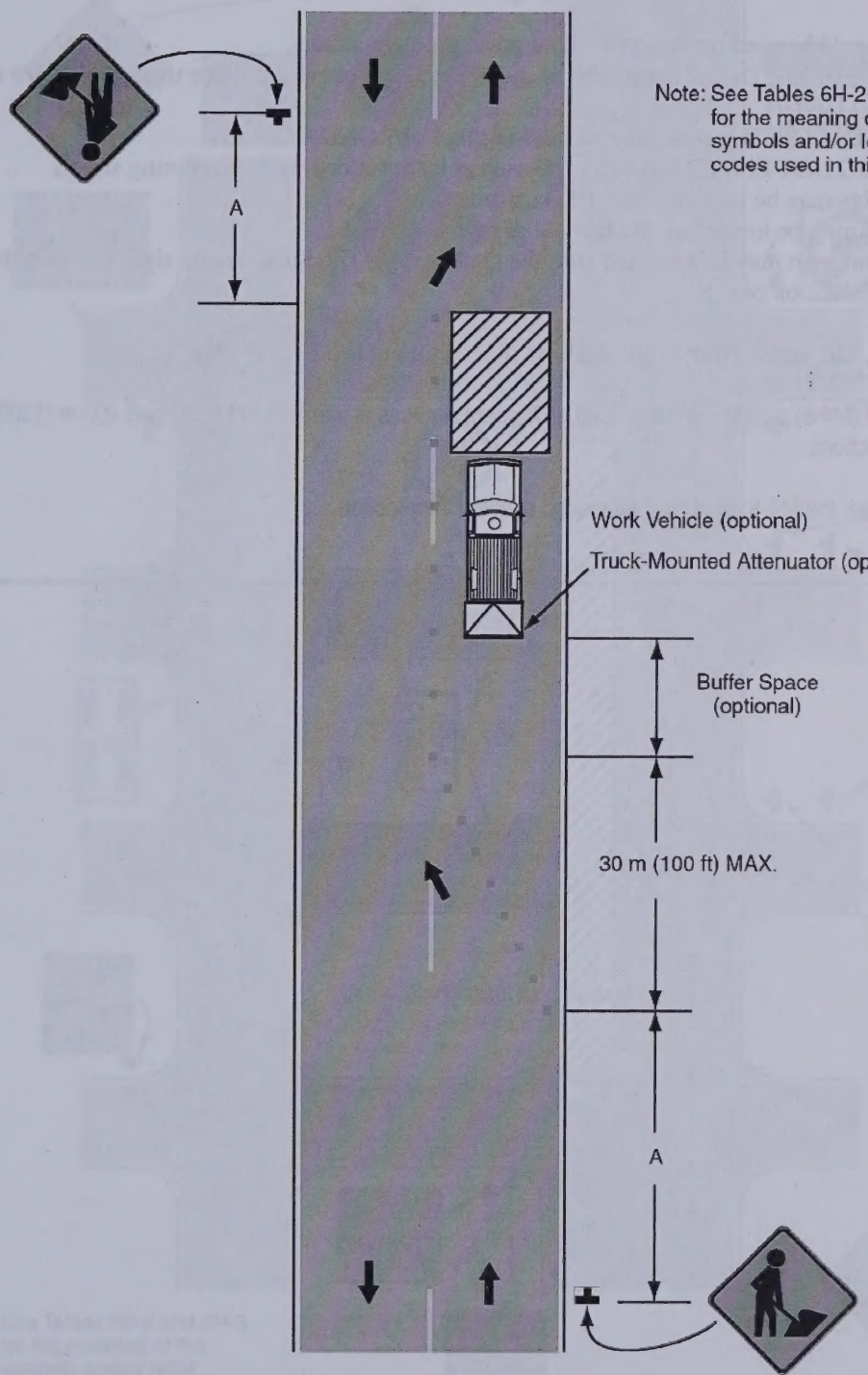
Figure 6H-18. Lane Closure on Minor Street (TA-18)


Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
A
Work Vehicle (optional)
Truck-Mounted Attenuator (optional)
Buffer Space (optional)
30 m (100 ft) MAX.
A

Typical Application 18

Notes for Figure 6H-19—Typical Application 19

Detour for One Travel Direction

Guidance:

1. This plan should be used for streets without posted route numbers.
2. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.

Option:

3. The STREET CLOSED legend may be used in place of ROAD CLOSED.
4. Additional DO NOT ENTER signs may be used at intersections with intervening streets.
5. Warning lights may be used on Type III Barricades.
6. Detour signs may be located on the far side of intersections.
7. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

Standard:

8. When used, the Street Name sign shall be placed above the Detour sign.

Guidance:

9. The DETOUR (M4-8) sign should be placed on tangent sections at intervals not to exceed 400 m (1300 ft) and at major intersections.

Option:

10. In urban areas, the M4-8 signs may be placed at every intersection.

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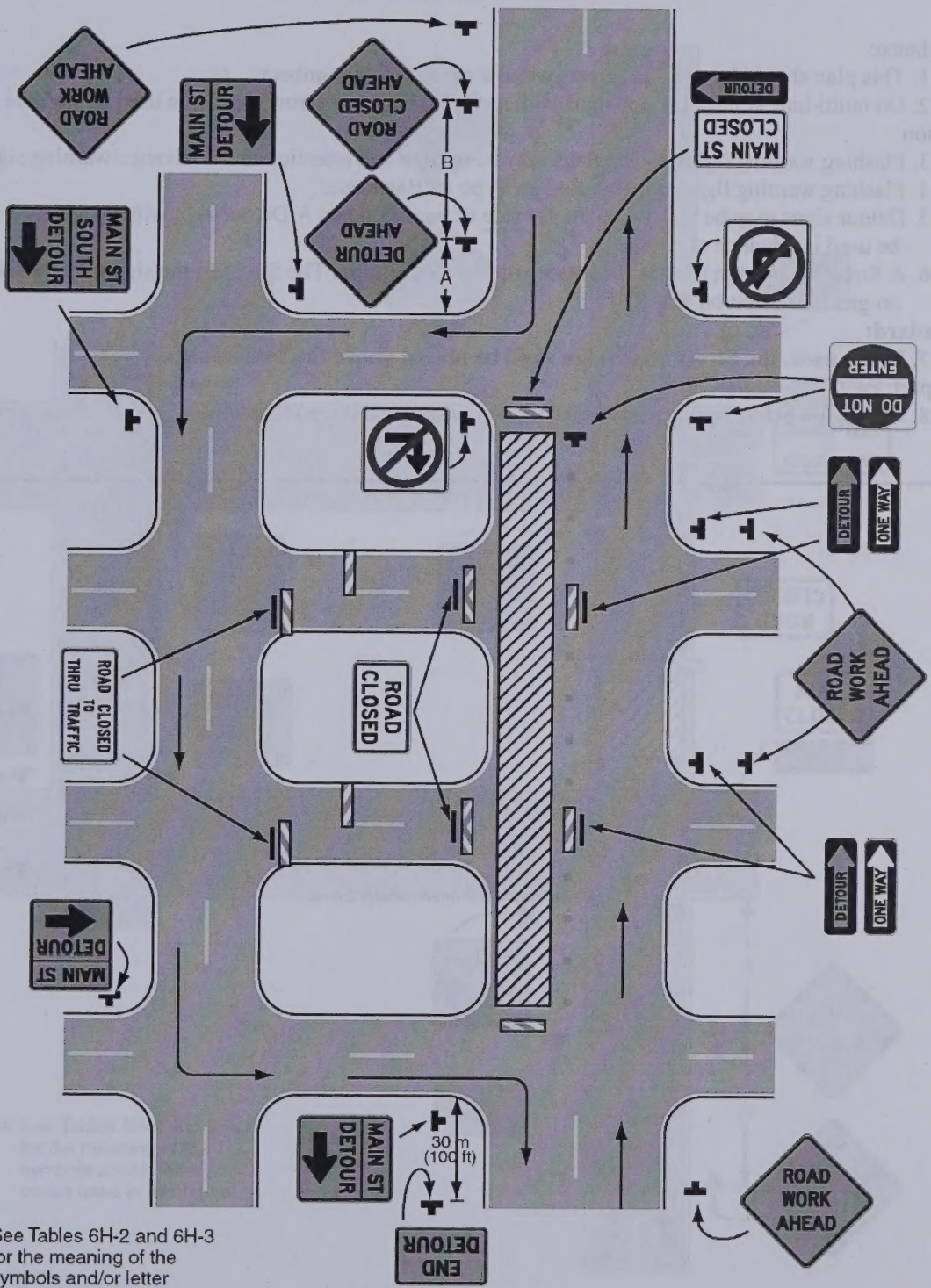
Figure 6H-19. Detour for One Travel Direction (TA-19)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 19

Notes for Figure 6H-20—Typical Application 20

Detour for Closed Street

Guidance:

1. This plan should be used for streets without posted route numbers.
2. On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.

Option:

3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
4. Flashing warning lights may be used on Type III Barricades.
5. Detour signs may be located on the far side of intersections. A Detour sign with an advance arrow may be used in advance of a turn.
6. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

Standard:

7. When used, the Street Name sign shall be placed above the Detour sign.

Support:

8. See Figure 6H-9 for the information for detouring a numbered highway.

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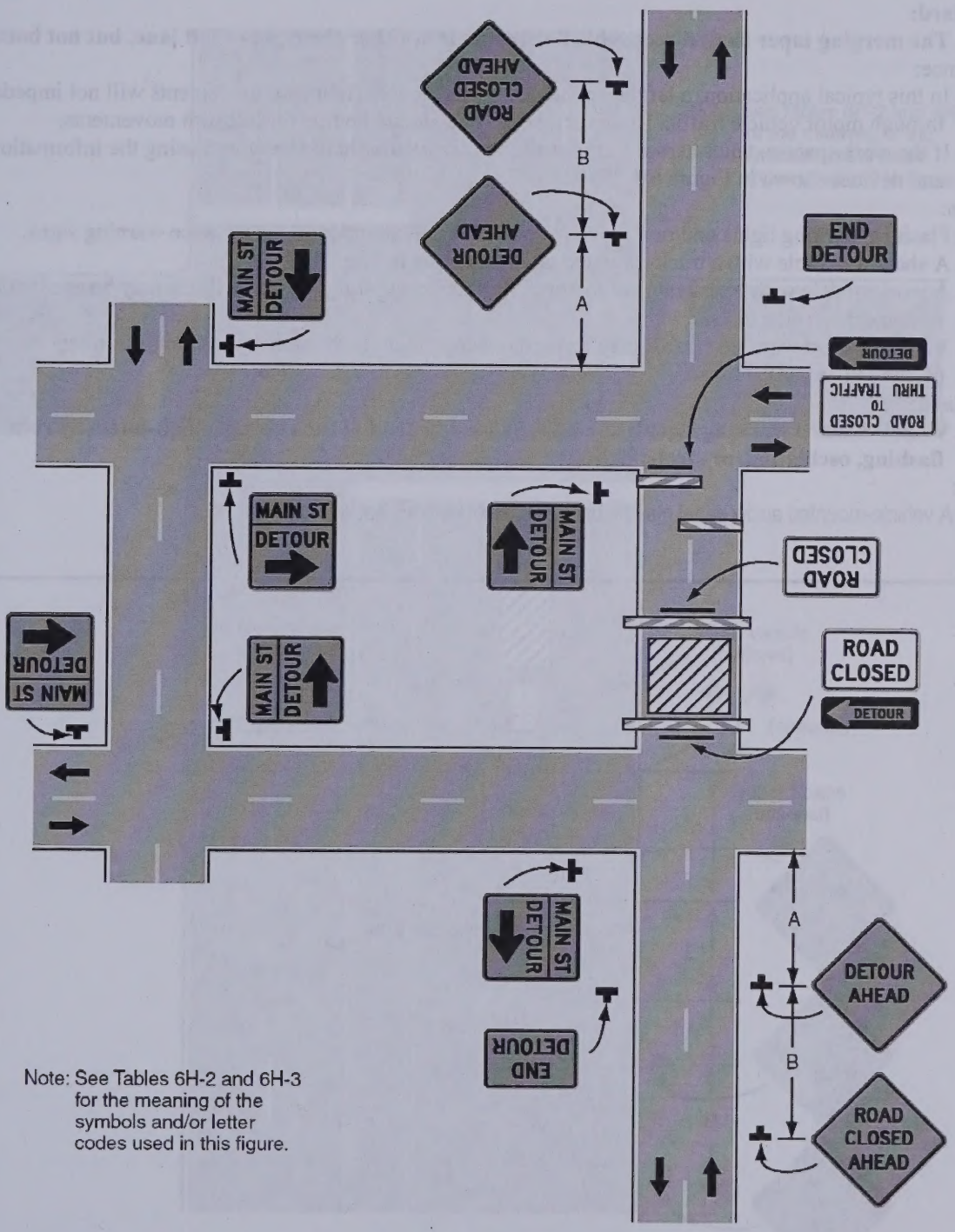
Figure 6H-20. Detour for Closed Street (TA-20)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 20

Notes for Figure 6H-21—Typical Application 21

Lane Closure on Near Side of Intersection

Standard:

1. The merging taper shall direct vehicular traffic into either the right or left lane, but not both.

Guidance:

2. In this typical application, a left taper should be used so that right-turn movements will not impede through motor vehicle traffic. However, the reverse should be true for left-turn movements.
3. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A shadow vehicle with a truck-mounted attenuator may be used.
6. A work vehicle with high-intensity rotating, flashing, oscillating, or strobe lights may be used with the high-level warning device.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

8. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

Option:

9. A vehicle-mounted arrow panel may be used to supplement this package.

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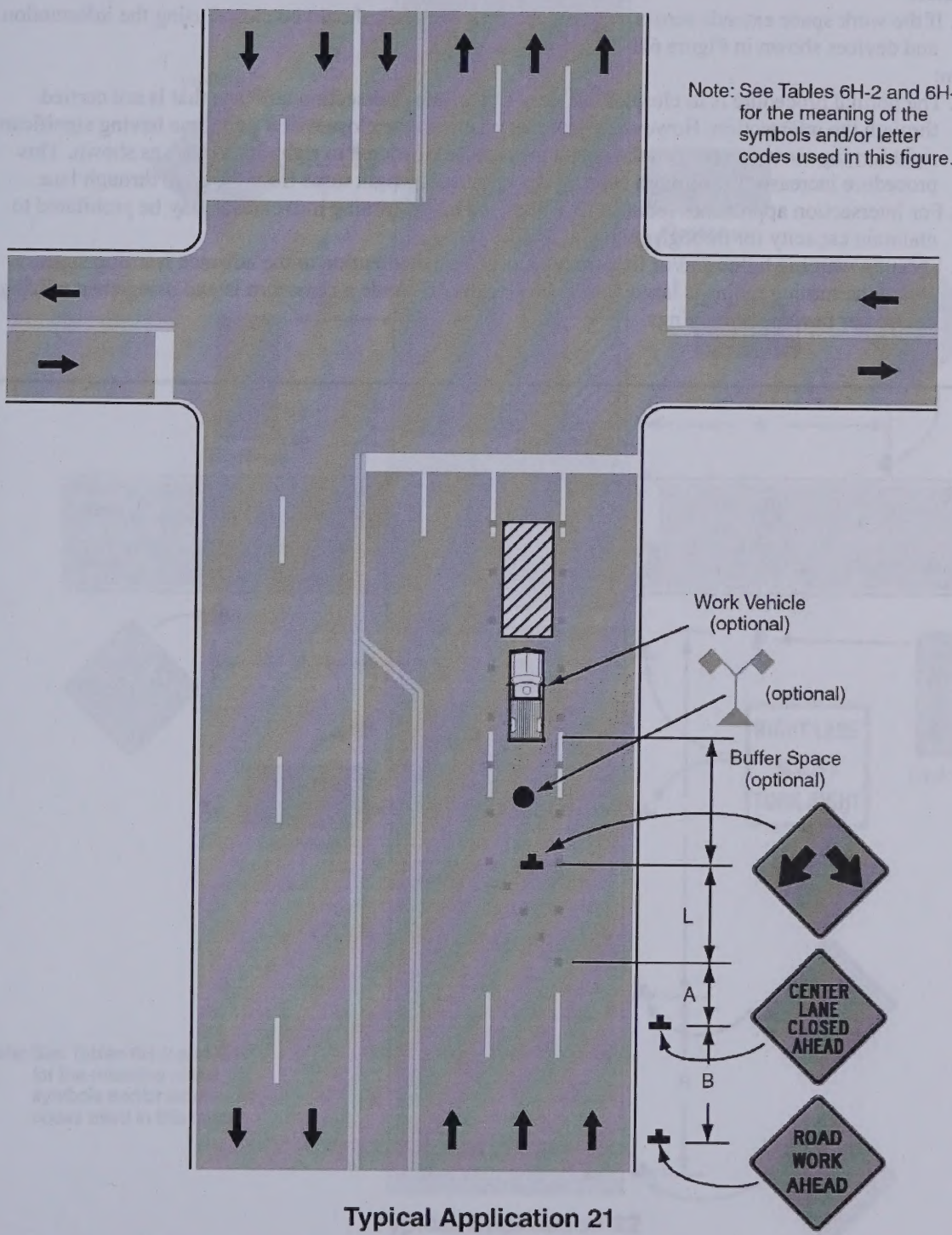
Figure 6H-21. Lane Closure on Near Side of Intersection (TA-21)


Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
Work Vehicle (optional)
(optional)
Buffer Space (optional)
L
A
B
CENTER LANE CLOSED AHEAD
ROAD WORK AHEAD

Typical Application 21

Notes for Figure 6H-22—Typical Application 22

Right Lane Closure on Far Side of Intersection

Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:

2. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turns only, as shown. This procedure increases the through capacity by eliminating right turns from the open through lane.
3. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. Where the turning radius is large, it may be possible to create a right-turn island using channelizing devices or pavement markings.

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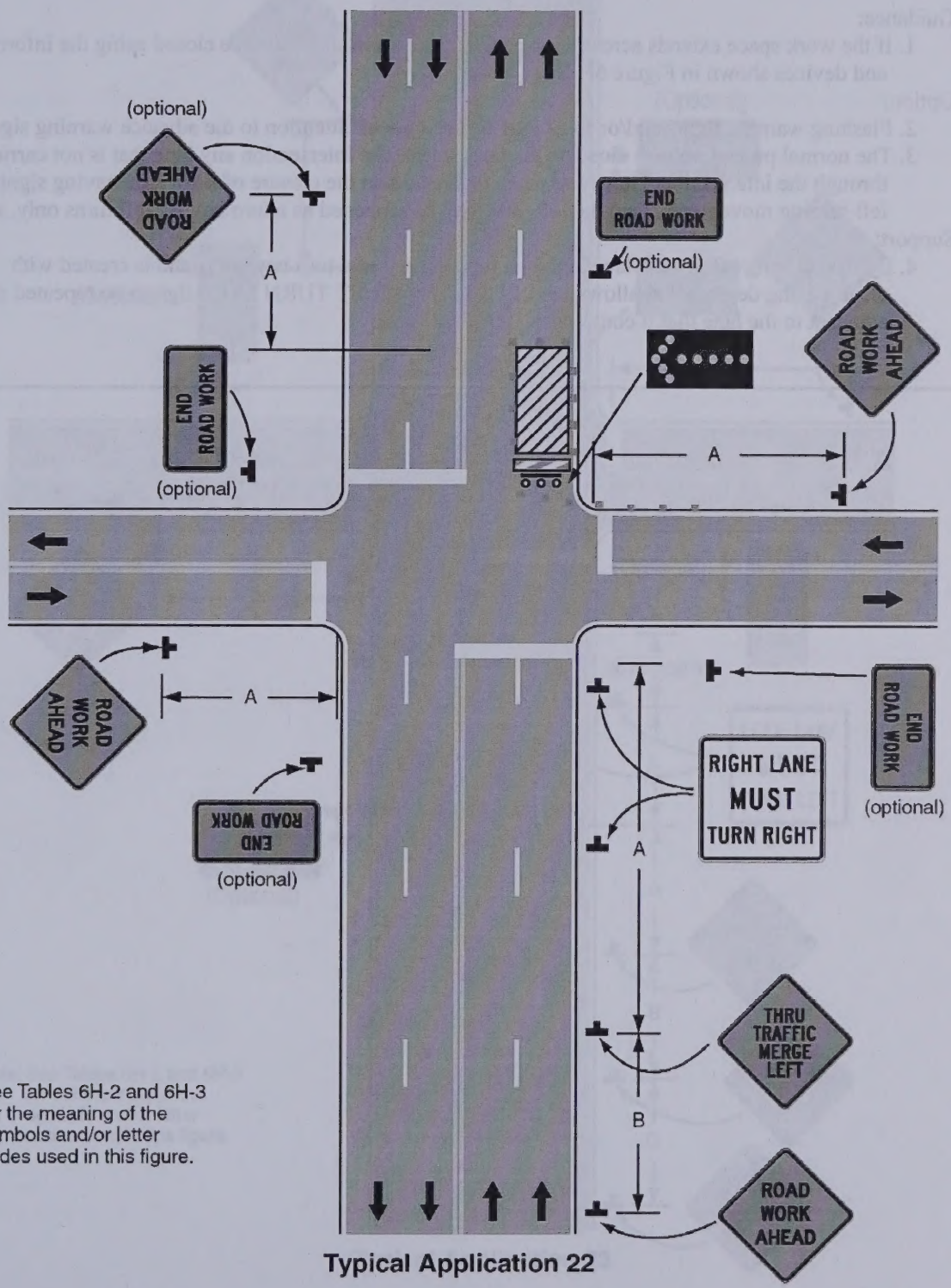
Figure 6H-22. Right Lane Closure on Far Side of Intersection (TA-22)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 22

Notes for Figure 6H-23—Typical Application 23

Left Lane Closure on Far Side of Intersection

Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.

Option:

2. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
3. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a left lane having significant left-turning movements, then the left lane may be reopened as a turn bay for left turns only, as shown.

Support:

4. By first closing off the left lane and then reopening it as a turn bay, an island is created with channelizing devices that allows the LEFT LANE MUST TURN LEFT sign to be repeated on the left adjacent to the lane that it controls.

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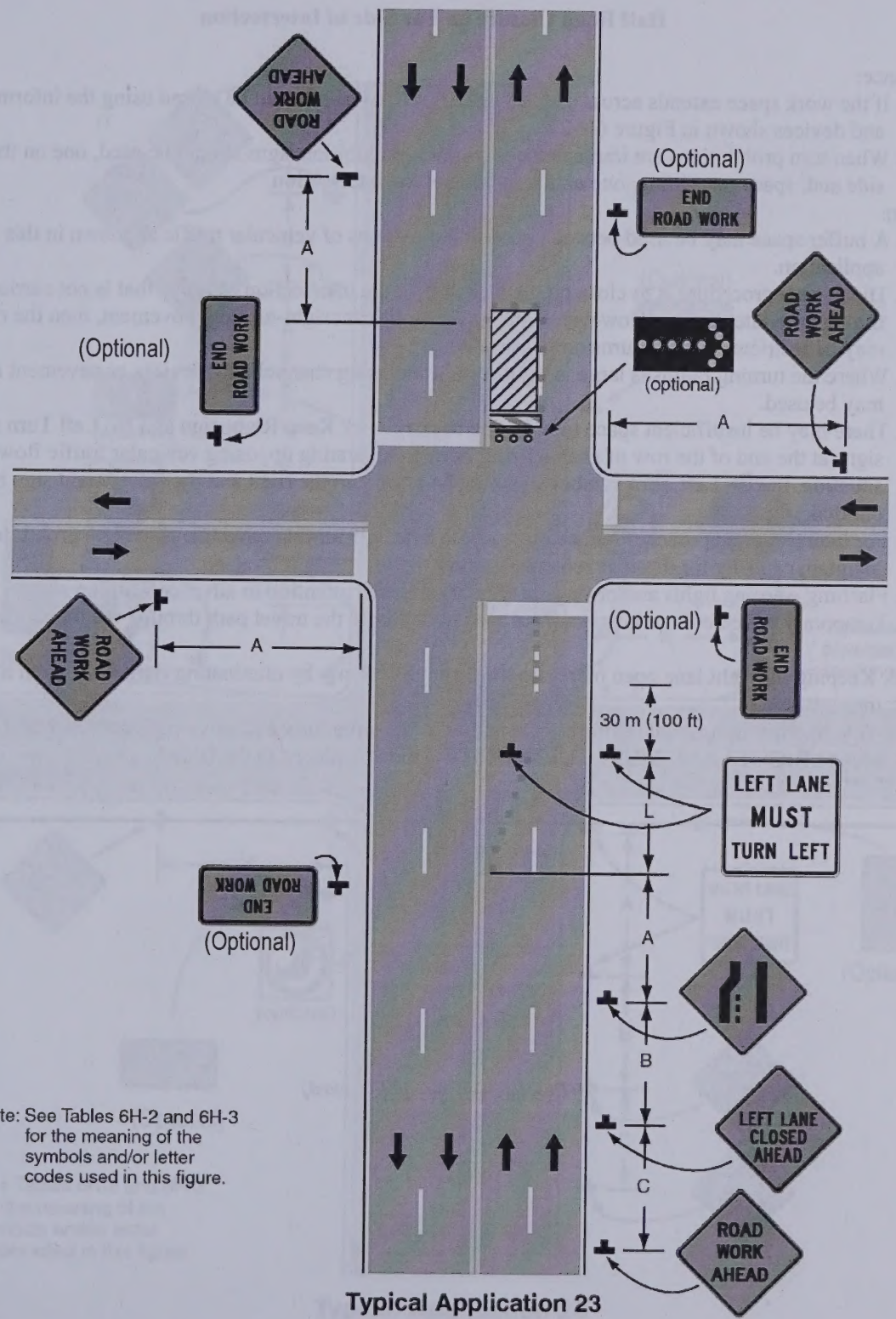
Figure 6H-23. Left Lane Closure on Far Side of Intersection (TA-23)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 23

Notes for Figure 6H-24—Typical Application 24

Half Road Closure on Far Side of Intersection

Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.
2. When turn prohibitions are implemented, two turn prohibition signs should be used, one on the near side and, space permitting, one on the far side of the intersection.

Option:

3. A buffer space may be used between opposing directions of vehicular traffic as shown in this application.
4. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, if there is a significant right-turning movement, then the right lane may be restricted to right turns only, as shown.
5. Where the turning radius is large, a right-turn island using channelizing devices or pavement markings may be used.
6. There may be insufficient space to place the back-to-back Keep Right sign and No Left Turn symbol signs at the end of the row of channelizing devices separating opposing vehicular traffic flows. In this situation, the No Left Turn symbol sign may be placed on the right and the Keep Right sign may be omitted.
7. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.
8. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
9. Temporary pavement markings may be used to delineate the travel path through the intersection.

Support:

10. Keeping the right lane open increases the through capacity by eliminating right turns from the open through lane.
11. A temporary turn island reinforces the nature of the temporary exclusive right-turn lane and enables a second RIGHT LANE MUST TURN RIGHT sign to be placed in the island.

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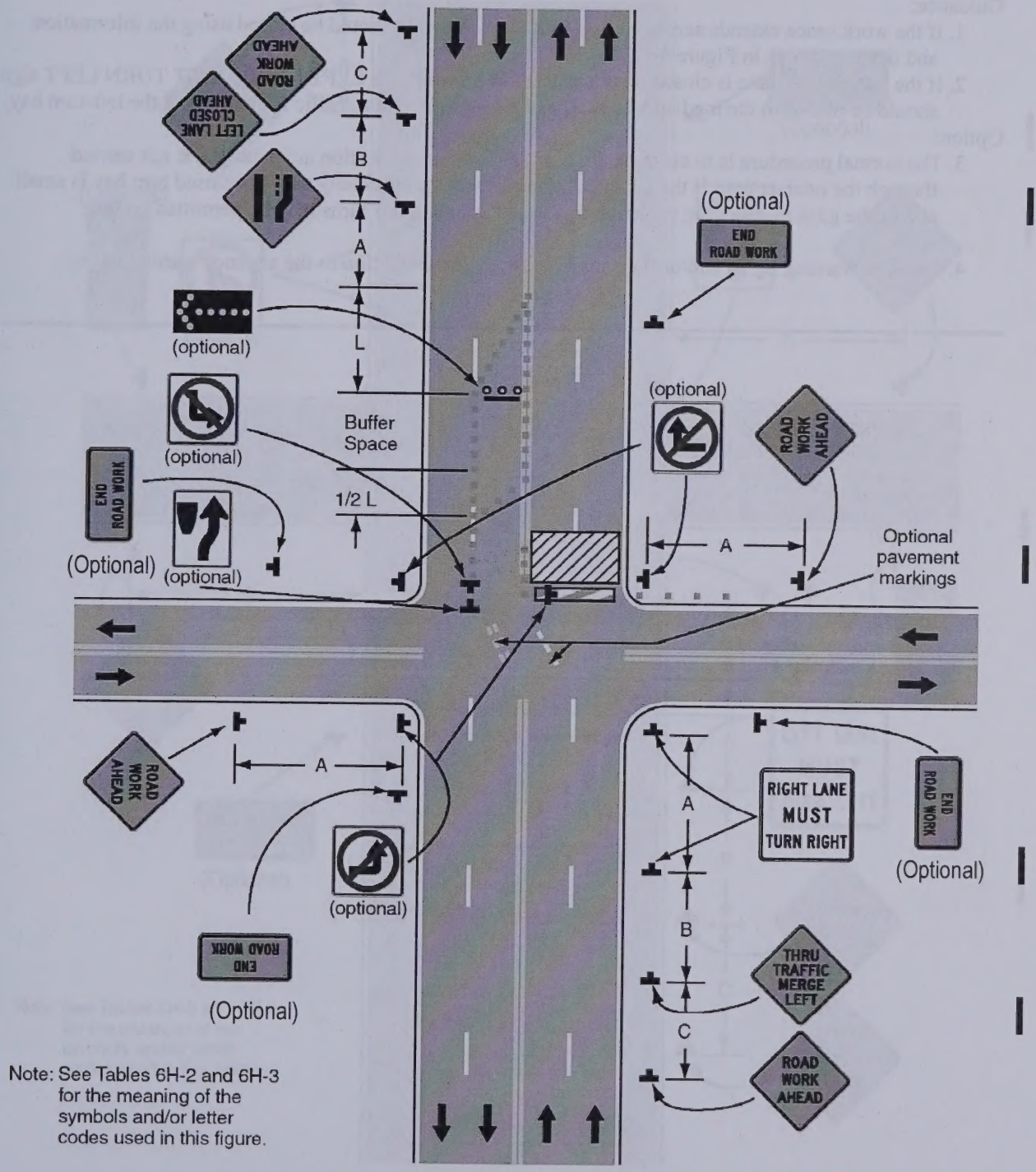
Figure 6H-24. Half Road Closure on Far Side of Intersection (TA-24)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 24

Notes for Figure 6H-25—Typical Application 25

Multiple Lane Closures at Intersection

Guidance:

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.
2. If the left through lane is closed on the near-side approach, the LEFT LANE MUST TURN LEFT sign should be placed in the median to discourage through vehicular traffic from entering the left-turn bay.

Option:

3. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. If the left-turning movement that normally uses the closed turn bay is small and/or the gaps in opposing vehicular traffic are frequent, left turns may be permitted on that approach.
4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

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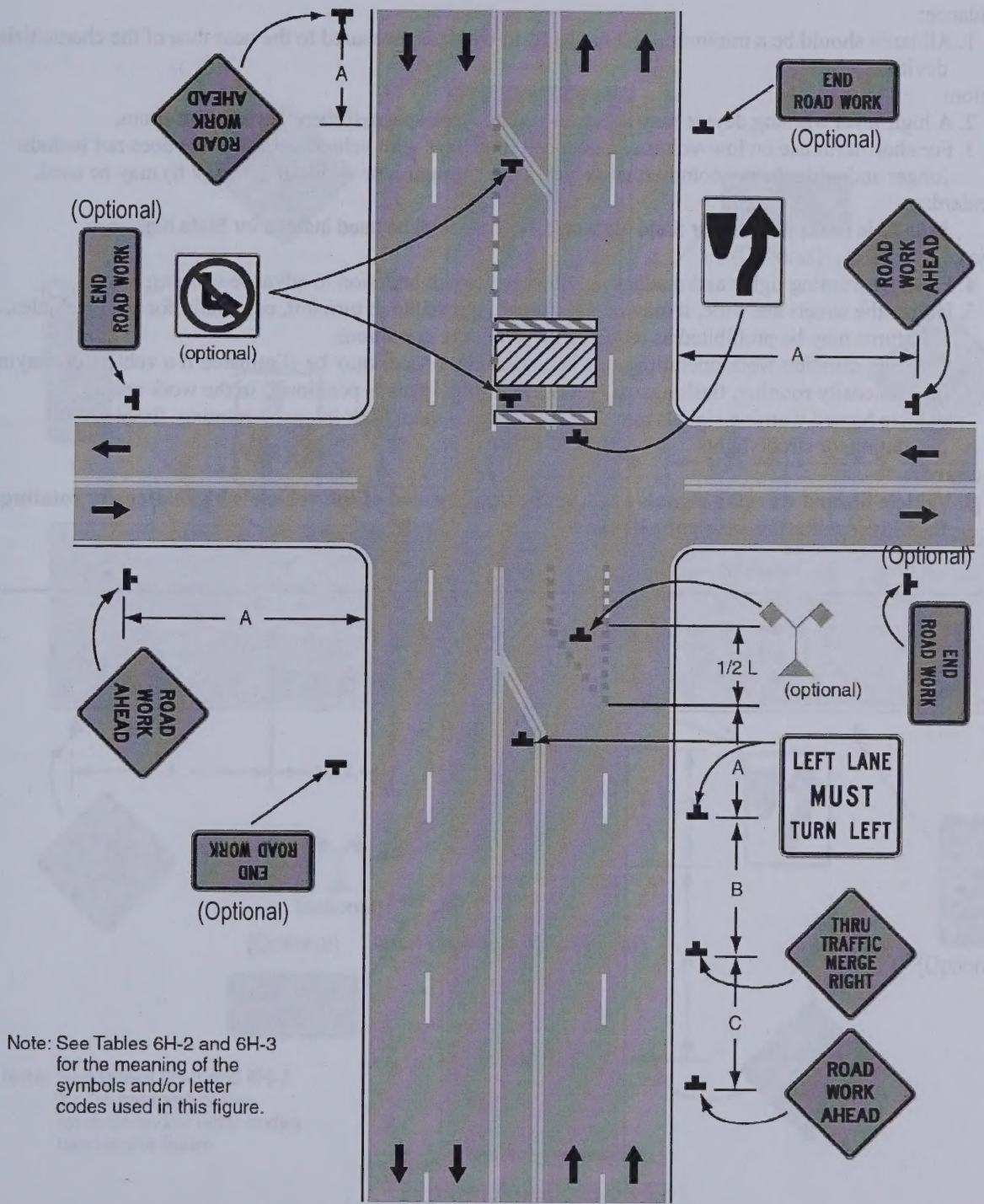
Figure 6H-25. Multiple Lane Closures at Intersection (TA-25)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 25

Notes for Figure 6H-26—Typical Application 26

Closure in Center of Intersection

Guidance:

1. All lanes should be a minimum of 3 m (10 ft) in width as measured to the near face of the channelizing devices.

Option:

2. A high-level warning device may be placed in the work space, if there is sufficient room.
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 2.7 m (9 ft) may be used.

Standard:

Note #3 is not applicable for State highways. Note #1 shall be used instead for State highways.

Option:

4. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
5. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles. Left turns may be prohibited as required by geometric conditions.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

8. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

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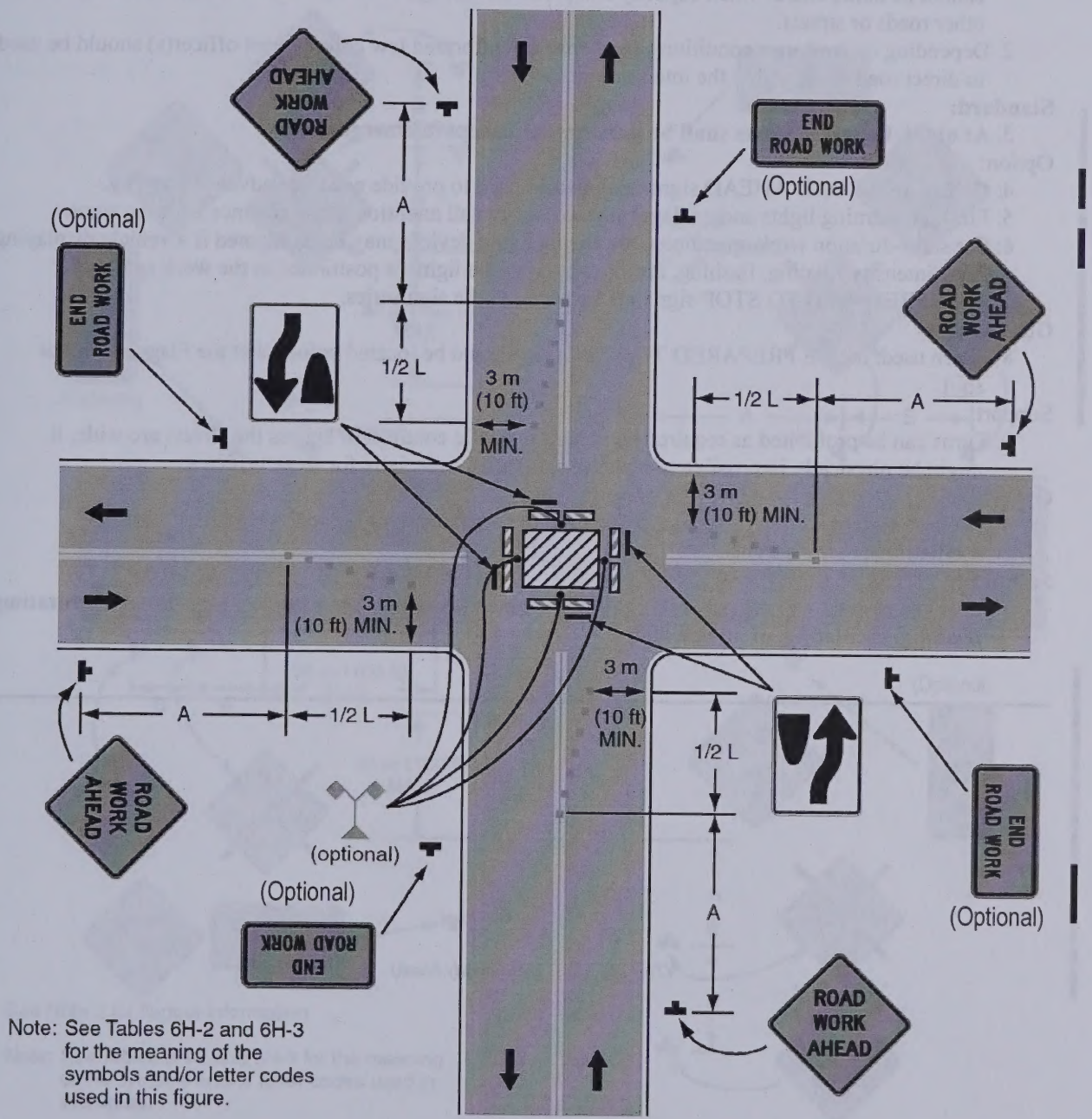
Figure 6H-26. Closure in Center of Intersection (TA-26)



Typical Application 26

Notes for Figure 6H-27—Typical Application 27

Closure at Side of Intersection

Guidance:

1. The situation depicted can be simplified by closing one or more of the intersection approaches. If this cannot be done, and/or when capacity is a problem, through vehicular traffic should be directed to other roads or streets.
2. Depending on road user conditions, flagger(s) or uniformed law enforcement officer(s) should be used to direct road users within the intersection.

Standard:

3. At night, flagger stations shall be illuminated, except in emergencies.

Option:

4. ONE LANE ROAD AHEAD signs may also be used to provide adequate advance warning.
5. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

8. When used, the BE PREPARED TO STOP sign should be located ~~before~~ after the Flagger symbol sign.

Support:

9. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

Option:

10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

11. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

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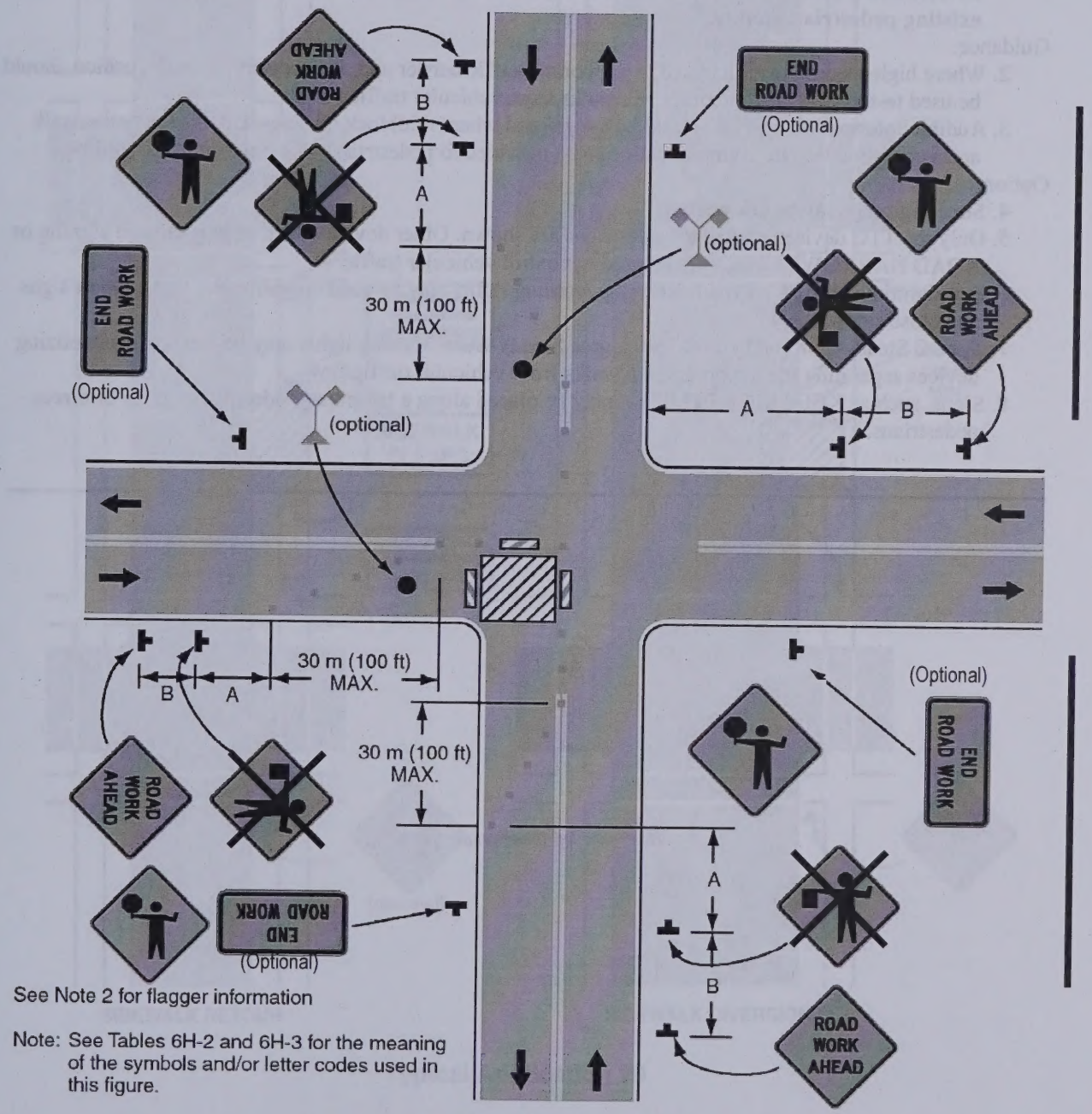
Figure 6H-27. Closure at Side of Intersection (TA-27)



See Note 2 for flagger information

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 27

Notes for Figure 6H-28—Typical Application 28

Sidewalk Closures and Bypass Sidewalks

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**

Guidance:

2. Where high speeds are anticipated, a temporary traffic barrier and, if necessary, a crash cushion should be used to separate the temporary sidewalks from vehicular traffic.
3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.

Option:

4. Street lighting may be considered.
5. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
6. For nighttime closures, Type A Flashing warning lights may be used on barricades that support signs and close sidewalks.
7. Type C Steady-Burn or Type D 360-degree Steady-Burn warning lights may be used on channelizing devices separating the temporary sidewalks from vehicular traffic flow.
8. Signs, such as KEEP RIGHT (LEFT), may be placed along a temporary sidewalk to guide or direct pedestrians.

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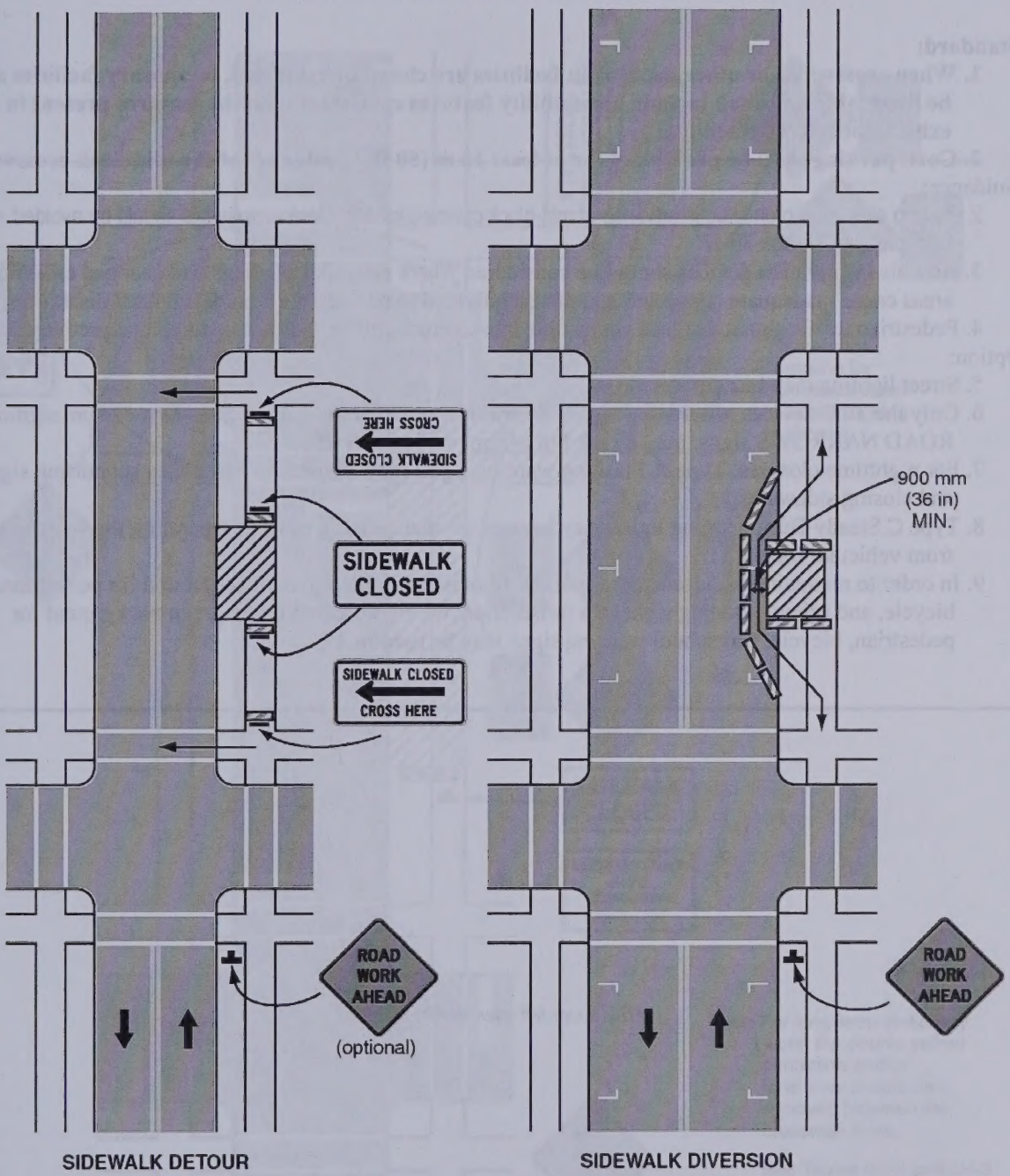
Figure 6H-28. Sidewalk Detour or Diversion (TA-28)



Typical Application 28

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Notes for Figure 6H-29—Typical Application 29

Crosswalk Closures and Pedestrian Detours

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**
2. ~~**Curb parking shall be prohibited for at least 15 m (50 ft) in advance of the midblock crosswalk.**~~

Guidance:

2. Parking should be prohibited in advance of mid-block crosswalks. Mid-block crosswalks should be avoided, when possible. See Section 3B.17.
3. Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.
4. Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.

Option:

5. Street lighting may be considered.
6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.
8. Type C Steady-Burn warning lights may be used on channelizing devices separating the work space from vehicular traffic.
9. In order to maintain the systematic use of the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs in a jurisdiction, the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs may be used in TTC zones.

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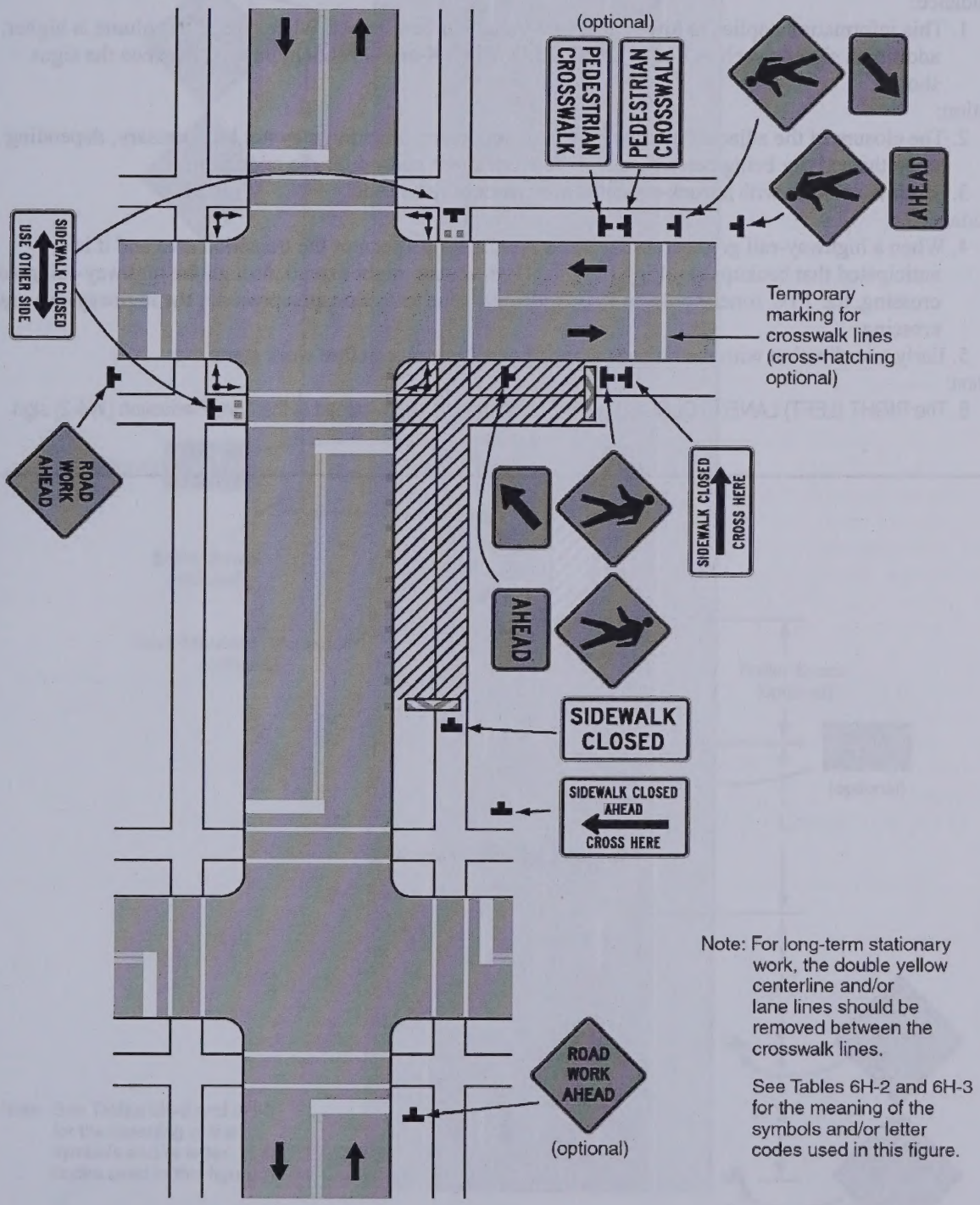
Figure 6H-29. Crosswalk Closures and Pedestrian Detours (TA-29)


(optional)
PEDESTRIAN CROSSWALK
PEDESTRIAN CROSSWALK
AHEAD
SIDEWALK CLOSED USE OTHER SIDE
Temporary marking for crosswalk lines (cross-hatching optional)
ROAD WORK AHEAD
SIDEWALK CLOSED CROSS HERE
AHEAD
SIDEWALK CLOSED
SIDEWALK CLOSED AHEAD CROSS HERE
ROAD WORK AHEAD
(optional)
Note: For long-term stationary work, the double yellow centerline and/or lane lines should be removed between the crosswalk lines.
See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 29

Notes for Figure 6H-30—Typical Application 30

Interior Lane Closure on Multi-lane Street

Guidance:

1. This information applies to low-speed, low-volume urban streets. Where speed or volume is higher, additional signing such as LEFT LANE CLOSED XX ~~m~~ (FT) should be used between the signs shown.

Option:

2. The closure of the adjacent interior lane in the opposing direction may not be necessary, depending upon the activity being performed and the work space needed for the operation.
3. Shadow vehicles with a truck-mounted attenuator may be used.

Guidance:

4. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that backups resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the transition area precedes the highway-rail grade crossing.
5. Early coordination with the railroad company should occur before work starts.

Option:

6. The RIGHT (LEFT) LANE(S) CLOSED (W20-5) sign may be used instead of the Lane Reduction (W4-2) sign.

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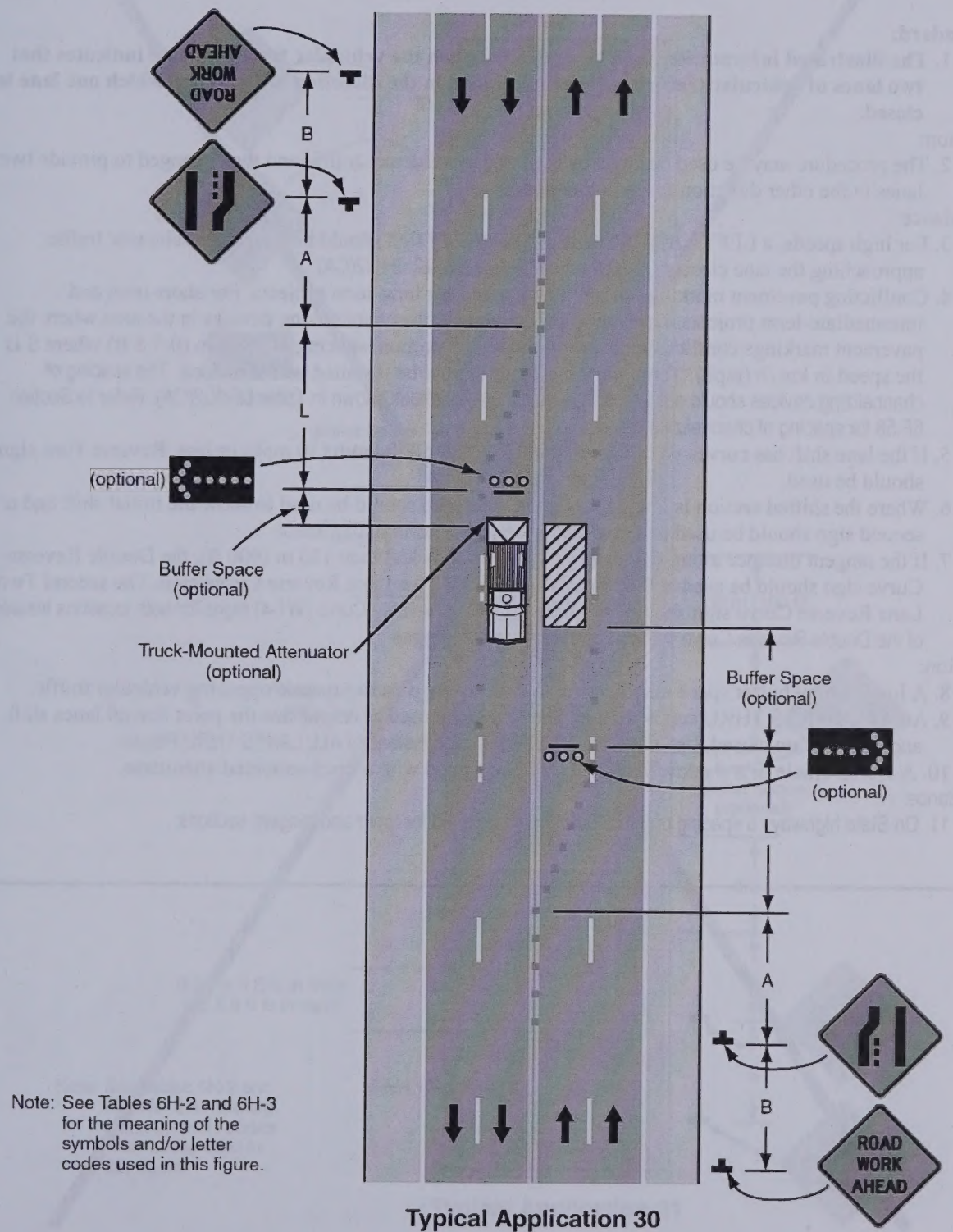
Figure 6H-30. Interior Lane Closure on Multi-lane Street (TA-30)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 30

Notes for Figure ~~6H-31~~ 6H-31(CA)—Typical Application 31

Lane Closure on Street with Uneven Directional Volumes

Standard:

1. **The illustrated information shall be used only when the vehicular traffic volume indicates that two lanes of vehicular traffic shall be maintained in the direction of travel for which one lane is closed.**

Option:

2. The procedure may be used during a peak period of vehicular traffic and then changed to provide two lanes in the other direction for the other peak.

Guidance:

3. For high speeds, a LEFT LANE CLOSED XX ~~m~~ (FT) sign should be added for vehicular traffic approaching the lane closure, as shown in Figure ~~6H-32~~ 6H-32(CA).
4. Conflicting pavement markings should be removed for long-term projects. For short-term and intermediate-term projects where this is not practical, the channelizing devices in the area where the pavement markings conflict should be placed at a maximum spacing of 0.1 S m (0.5 S ft) where S is the speed in km /h (mph). Temporary markings should be installed where needed. The spacing of channelizing devices should not exceed the maximum distances shown in Table 6F-102(CA). Refer to Section 6F.58 for spacing of channelizing devices.
5. If the lane shift has curves with recommended speeds of 50 km/h (30 mph) or less, Reverse Turn signs should be used.
6. Where the shifted section is long, a Reverse Curve sign should be used to show the initial shift and a second sign should be used to show the return to the normal alignment.
7. If the tangent distance along the temporary diversion is less than 180 m (600 ft), the Double Reverse Curve sign should be used at the location of the first Two Lane Reverse Curve sign. The second Two Lane Reverse Curve sign should be omitted. Use the Reverse Curve (W1-4) signs for both locations instead of the Double Reverse Curve or Two Lane Reverse Curve signs.

Option:

8. A longitudinal buffer space may be used in the activity area to separate opposing vehicular traffic.
9. An ALL LANES THRU supplemental plaque may be used to emphasize the point that all lanes shift and no lanes are closed. Use Reverse Curve (W1-4) sign instead of ALL LANES THRU Plaque.
10. A work vehicle or a shadow vehicle may be equipped with a truck-mounted attenuator.

Guidance:

11. On State highways a spacing of 3 m (10 ft) should be used for taper and tangent sections.

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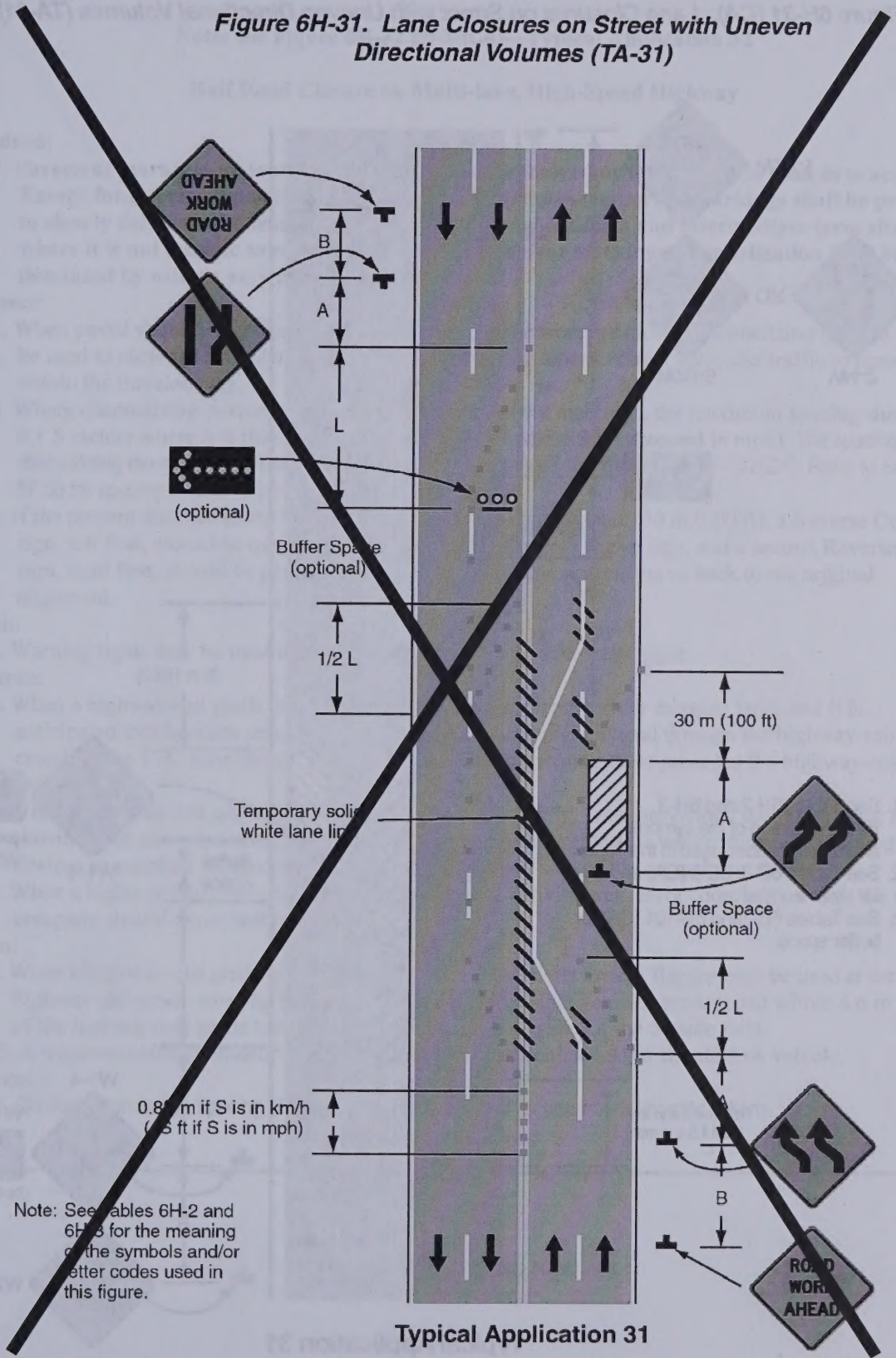
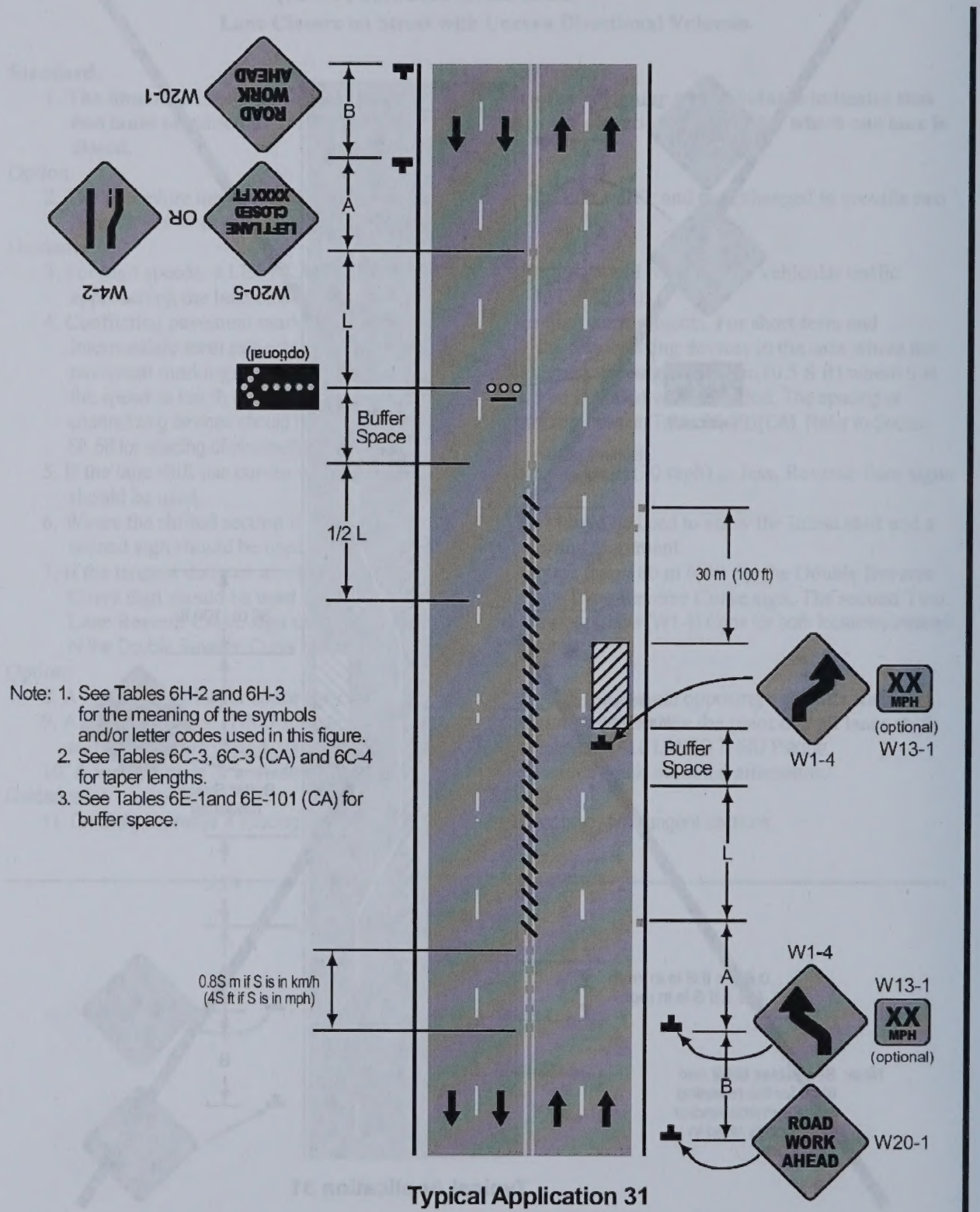
Figure 6H-31. Lane Closures on Street with Uneven Directional Volumes (TA-31)



Typical Application 31

Figure 6H-31 (CA). Lane Closures on Street with Uneven Directional Volumes (TA-31)



Note: 1. See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
2. See Tables 6C-3, 6C-3 (CA) and 6C-4 for taper lengths.
3. See Tables 6E-1and 6E-101 (CA) for buffer space.

Typical Application 31

Notes for Figure ~~6H-32~~ 6H-32(CA)—Typical Application 32

Half Road Closure on Multi-lane, High-Speed Highway

Standard:

1. **Pavement markings no longer applicable shall be removed or obliterated as soon as practical. Except for intermediate-term and short-term situations, temporary markings shall be provided to clearly delineate the temporary travel path. For short-term and intermediate-term situations where it is not feasible to remove and restore pavement markings, channelization shall be made dominant by using a very close device spacing.**

Guidance:

2. When paved shoulders having a width of 2.4 m (8 ft) or more are closed, channelizing devices should be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.
3. Where channelizing devices are used instead of pavement markings, the maximum spacing should be 0.1 S meters where S is the speed in km/h (0.5 S feet where S is the speed in mph). The spacing of channelizing devices should not exceed the maximum distances shown in Table 6F-102(CA). Refer to Section 6F.58 for spacing of channelizing devices.
4. If the tangent distance along the temporary diversion is more than 180 m (600 ft), a Reverse Curve sign, left first, should be used instead of the Double Reverse Curve sign, and a second Reverse Curve sign, right first, should be placed in advance of the second reverse curve back to the original alignment.

Option:

5. Warning lights may be used to supplement channelizing devices at night.

Guidance:

6. When a highway-rail grade crossing exists within or upstream of the merging taper and it is anticipated that backups resulting from the lane closure might extend through the highway-rail grade crossing, the TTC zone should be extended so that the merging taper precedes the highway-rail grade crossing.
7. When a highway-rail grade crossing exists within the activity area, provisions should be made to provide road users operating on the left side of the normal centerline with comparable warning devices as supplied for road users operating on the right side of the normal centerline.
8. When a highway-rail grade crossing exists within the activity area, early coordination with the railroad company should occur before work starts.

Option:

9. When a highway-rail grade crossing exists within the activity area, a flagger may be used at the highway-rail grade crossing to minimize the probability that vehicles are stopped within 4.6 m (15 ft) of the highway-rail grade crossing, measured from both sides of the outside rails.
10. A truck-mounted attenuator may be used on the work vehicle and/or the shadow vehicle.

Guidance:

11. On State highways a spacing of 3 m (10 ft) should be used for taper and tangent sections.

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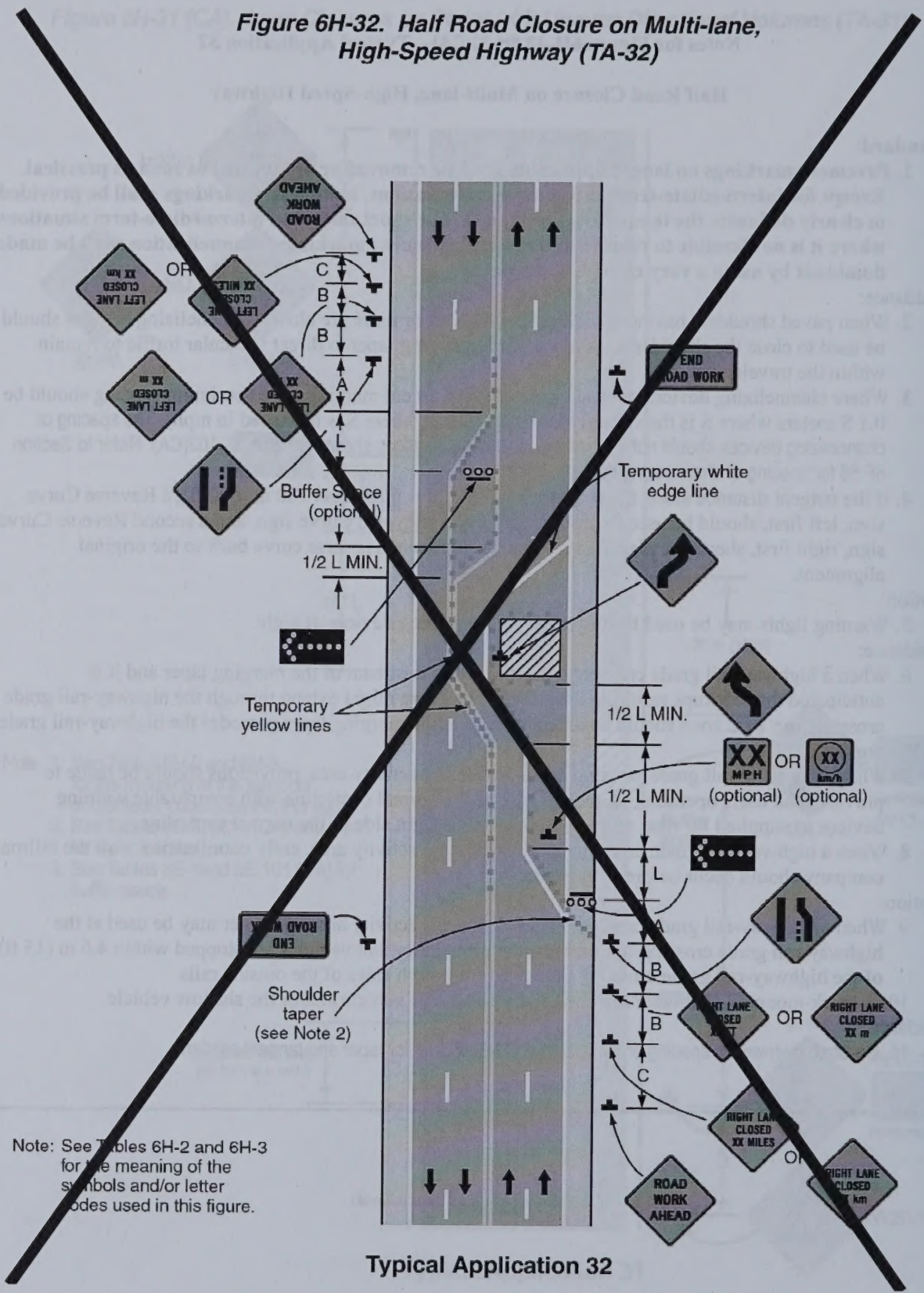
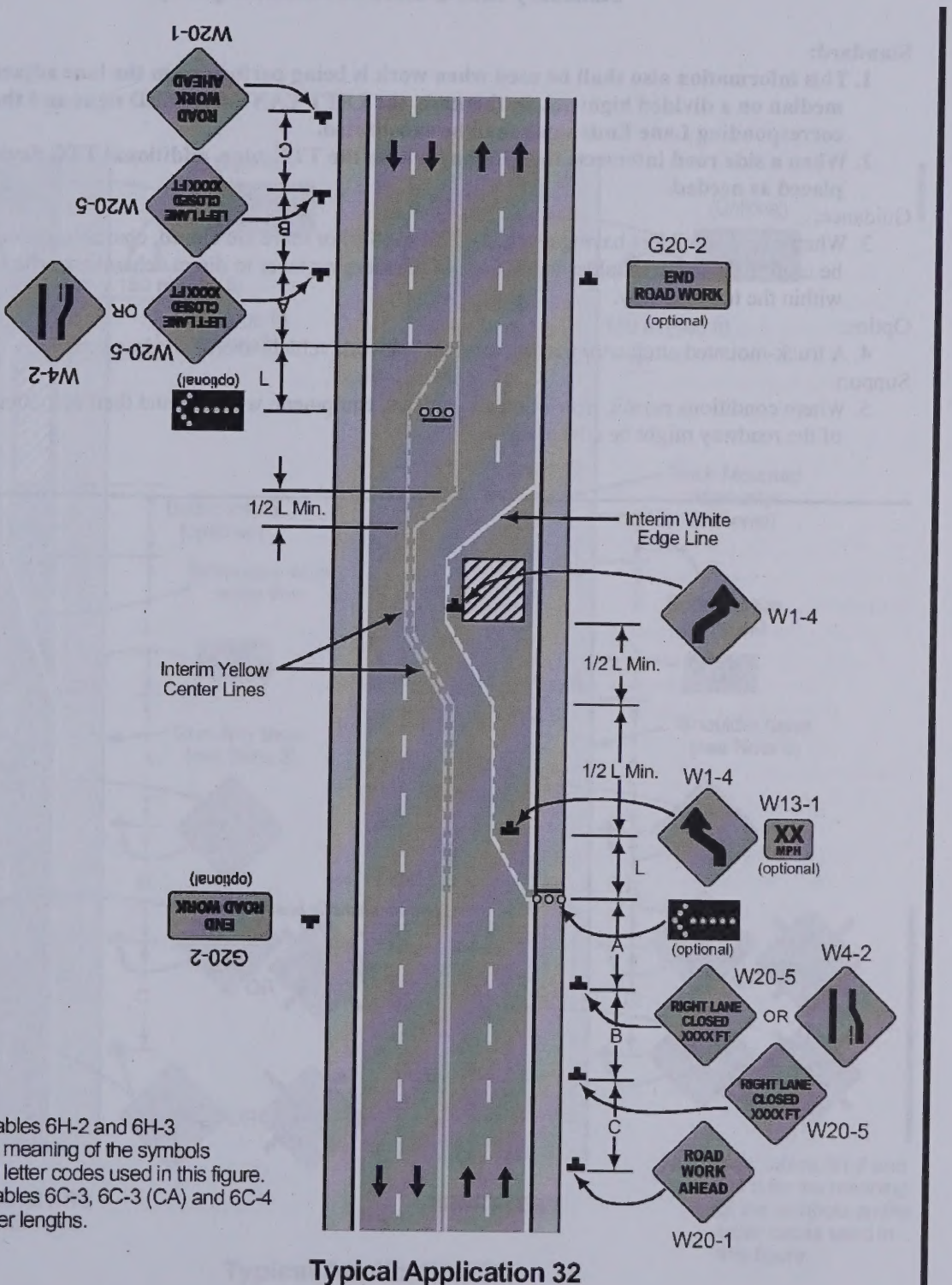
Figure 6H-32. Half Road Closure on Multi-lane, High-Speed Highway (TA-32)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 32

Figure 6H-32 (CA). Half Road Closure on Multilane, High-Speed Highway (TA-32)



Note: 1. See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.
2. See Tables 6C-3, 6C-3 (CA) and 6C-4 for taper lengths.

Typical Application 32

Notes for Figure 6H-33—Typical Application 33

Stationary Lane Closure on Divided Highway

Standard:

1. **This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the LEFT LANE CLOSED signs and the corresponding Lane Ends signs shall be substituted.**
2. **When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.**

Guidance:

3. When paved shoulders having a width of 2.4 m (8 ft) or more are closed, channelizing devices should be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.

Option:

4. A truck-mounted attenuator may be used on the work vehicle and/or shadow vehicle.

Support:

5. Where conditions permit, restricting all vehicles, equipment, workers, and their activities to one side of the roadway might be advantageous.

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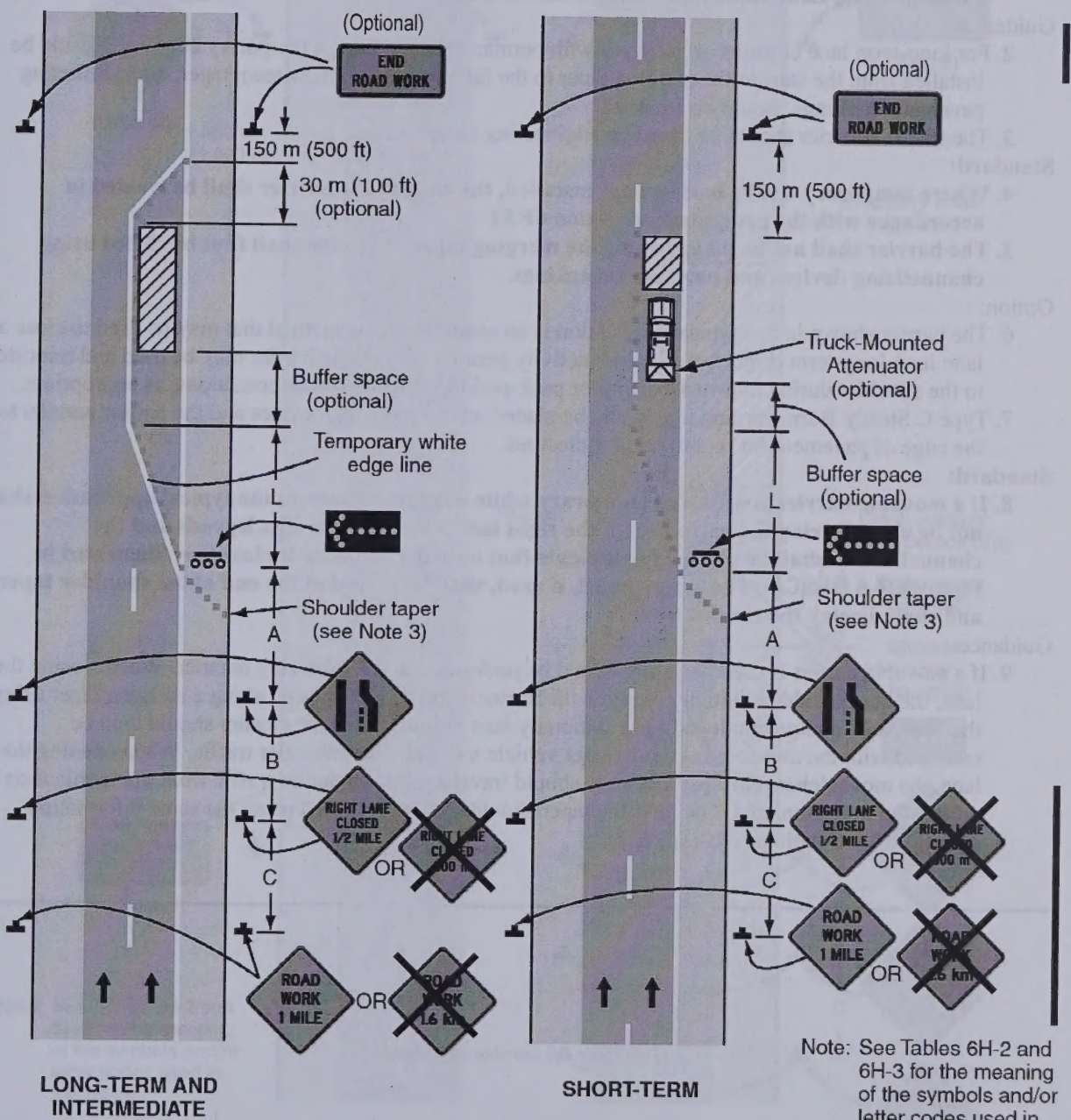
Figure 6H-33. Stationary Lane Closure on Divided Highway (TA-33)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 33

Notes for Figure 6H-34—Typical Application 34

Lane Closure with Temporary Traffic Barrier

Standard:

1. This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the LEFT LANE CLOSED signs and the corresponding Lane Ends signs shall be substituted.

Guidance:

2. For long-term lane closures on facilities with permanent edge lines, a temporary edge line should be installed from the start of the merging taper to the far end of the downstream taper, and conflicting pavement markings should be removed.
3. The use of a barrier should be based on engineering judgment.

Standard:

4. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.81

5. The barrier shall not be placed along the merging taper. The lane shall first be closed using channelizing devices and pavement markings.

Option:

6. The barrier shown in this typical application is an example of one method that may be used to close a lane for a long-term project. If the work activity permits, a movable barrier may be used and relocated to the shoulder during nonwork periods or peak-period vehicular traffic conditions, as appropriate.
7. Type C Steady-Burn warning lights may be placed on channelizing devices and the barrier parallel to the edge of pavement for nighttime lane closures.

Standard:

8. If a movable barrier is used, the temporary white edge line shown in the typical application shall not be used. During the period when the right lane is opened, the sign legends and the channelization shall be changed to indicate that only the shoulder is closed, as illustrated in Figure ~~6H-5~~ 6H-5(CA). The arrow panel, if used, shall be placed at the end of the shoulder taper and shall display the caution mode.

Guidance:

9. If a movable barrier is used, the shift should be performed in the following manner. When closing the lane, the lane should be initially closed with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the movablebarrier transfer vehicle should travel against vehicular traffic from the termination area to the transition area. The merging taper should then be removed using the same information employed for a stationary lane closure.

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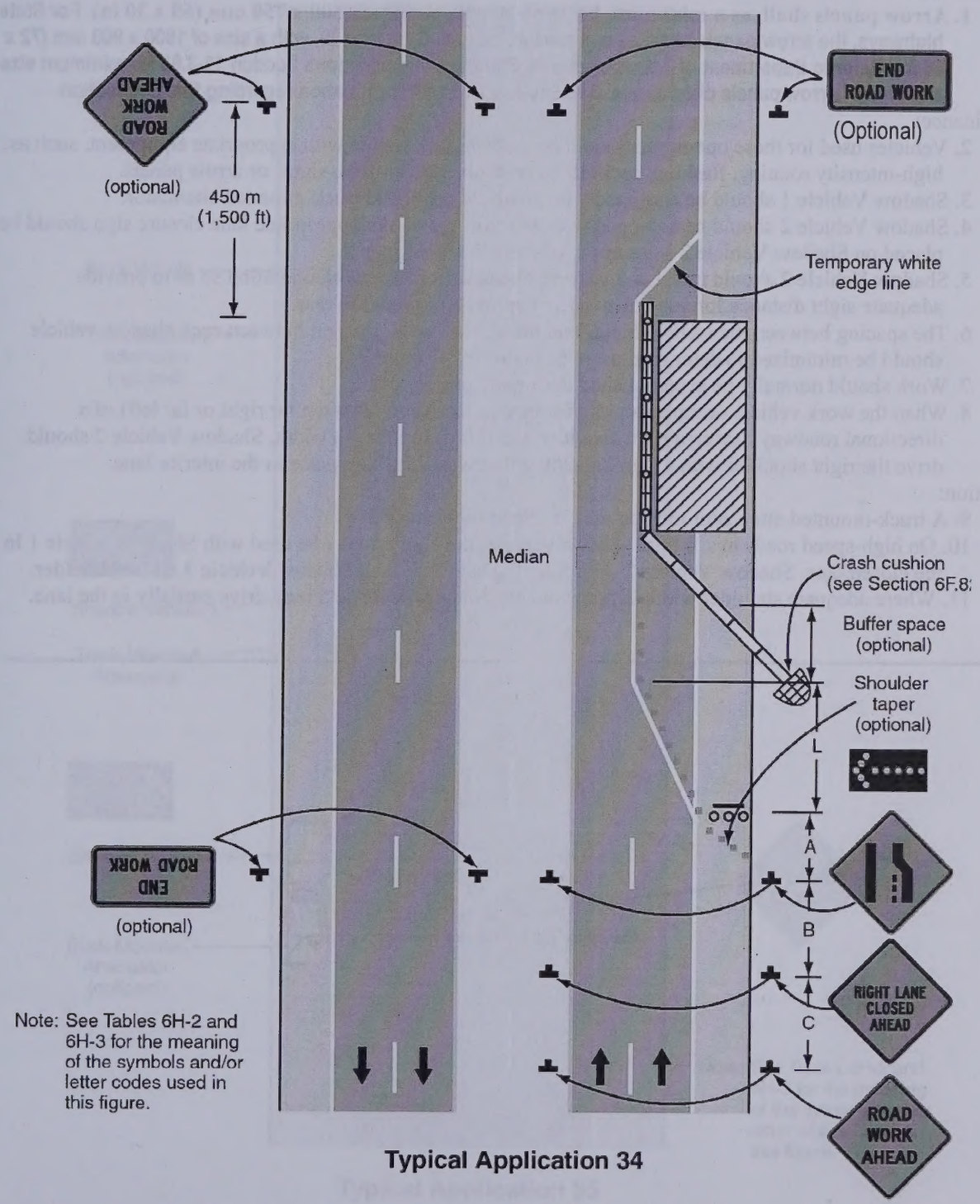
Figure 6H-34. Lane Closure with Temporary Traffic Barrier (TA-34)



Typical Application 34

Notes for Figure 6H-35—Typical Application 35

Mobile Operation on Multi-lane Road

Standard:

1. **Arrow panels shall, as a minimum, be Type B, with a size of 1500 x 750 mm (60 x 30 in). For State highways, the arrow panels shall, as a minimum, be type B (or type II), with a size of 1800 x 900 mm (72 x 36 in). Refer to Department of Transportation's Standard Specifications Section 12-3.03 for minimum size and type of arrow panels cited above. See Section 1A.11 for information regarding this publication.**

Guidance:

2. Vehicles used for these operations should be made highly visible with appropriate equipment, such as: high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow panels.
3. Shadow Vehicle 1 should be equipped with an arrow panel and truck-mounted attenuator.
4. Shadow Vehicle 2 should be equipped with an arrow panel. An appropriate lane closure sign should be placed on Shadow Vehicle 2 so as not to obscure the arrow panel.
5. Shadow Vehicle 2 should travel at a varying distance from the work operation so as to provide adequate sight distance for vehicular traffic approaching from the rear.
6. The spacing between the work vehicles and the shadow vehicles, and between each shadow vehicle should be minimized to deter road users from driving in between.
7. Work should normally be accomplished during off-peak hours.
8. When the work vehicle occupies an interior lane (a lane other than the far right or far left) of a directional roadway having a right shoulder 3 m (10 ft) or more in width, Shadow Vehicle 2 should drive the right shoulder with a sign indicating that work is taking place in the interior lane.

Option:

9. A truck-mounted attenuator may be used on Shadow Vehicle 2.
10. On high-speed roadways, a third shadow vehicle (not shown) may be used with Shadow Vehicle 1 in the closed lane, Shadow Vehicle 2 straddling the edge line, and Shadow Vehicle 3 on the shoulder.
11. Where adequate shoulder width is not available, Shadow Vehicle 3 may drive partially in the lane.

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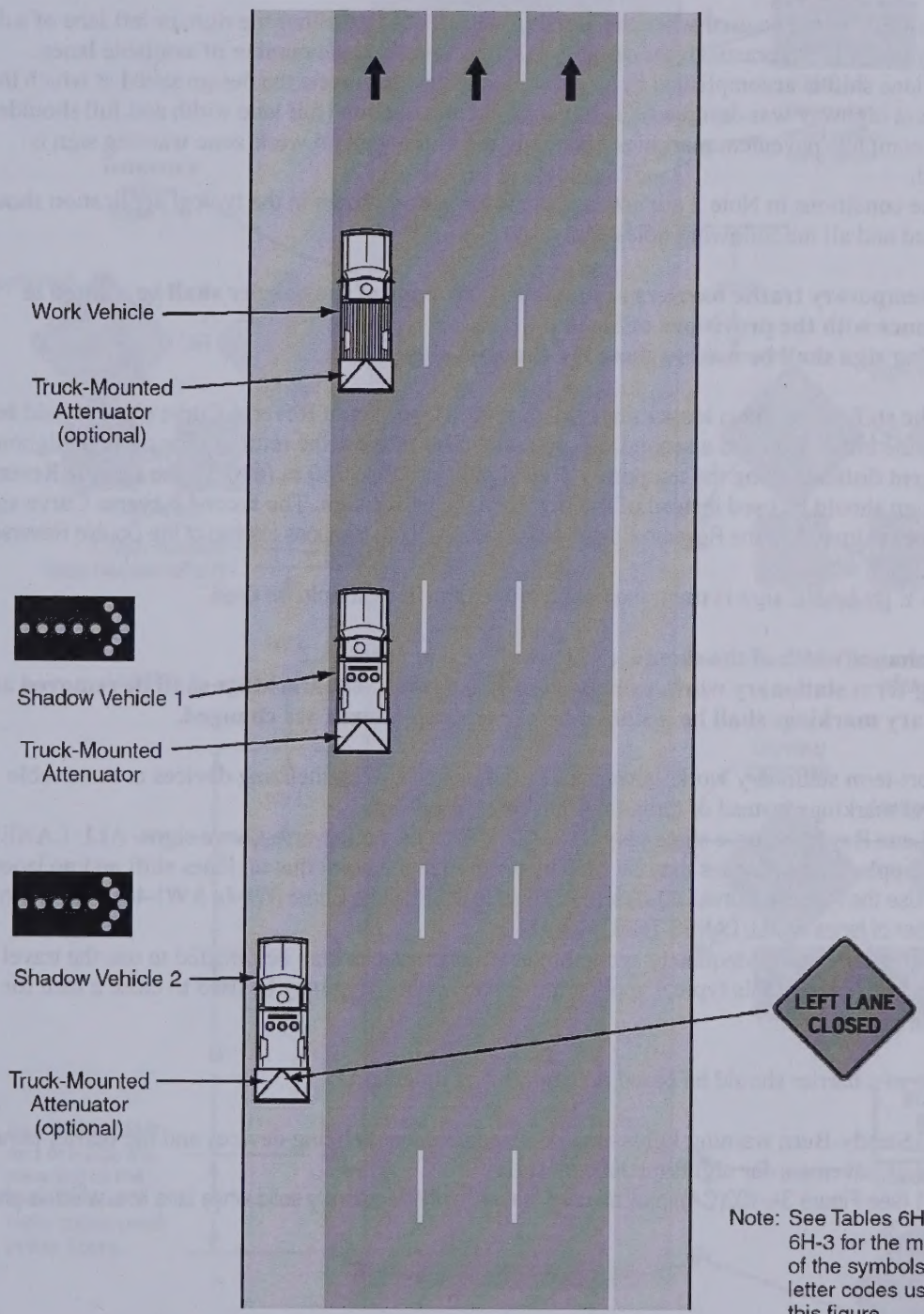
Figure 6H-35. Mobile Operation on Multi-lane Road (TA-35)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 35

Notes for Figure 6H-36—Typical Application 36

Lane Shift on Freeway

Guidance:

1. The lane shift should be used when the work space extends into either the right or left lane of a divided highway and it is not practical, for capacity reasons, to reduce the number of available lanes.
2. When a lane shift is accomplished by using (1) geometry that meets the design speed at which the permanent highway was designed, (2) full normal cross-section (full lane width and full shoulders), and (3) complete pavement markings, then only the initial general work-zone warning sign is required.
3. When the conditions in Note 2 are not met, the information shown in the typical application should be employed and all the following notes apply.

Standard:

4. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.81.

5. A warning sign shall be used to show the changed alignment.

Guidance:

6. Where the shifted section is longer than 180 m (600 ft), one set of Reverse Curve signs should be used to show the initial shift and a second set should be used to show the return to the normal alignment. If the tangent distance along the temporary diversion is less than 180 m (600 ft), the Double Reverse Curve sign should be used instead of the first Reverse Curve sign. The second Reverse Curve sign should be omitted. Use the Reverse Curve (W1-4) signs for both locations instead of the Double Reverse Curve (W24-1) sign.
7. If a STAY IN LANE sign is used, then solid white lane lines should be used.

Standard:

8. The minimum width of the shoulder lane shall be 3 m (10 ft).

9. For long-term stationary work, existing conflicting pavement markings shall be removed and temporary markings shall be installed before traffic patterns are changed.

Option:

10. For short-term stationary work, lanes may be delineated by channelizing devices or removable pavement markings instead of temporary pavement markings.
11. ~~Three Lane Reverse Curve signs may be used in place of the Reverse Curve signs.~~ ALL LANES THRU supplemental plaques may be used to emphasize the point that all lanes shift and no lanes are closed. Use the Reverse Curve (W1-4) signs instead of the Reverse Curve (W1-4a & W1-4b) signs which show the number of lanes or ALL LANES THRU Plaque.
12. If the shoulder cannot adequately accommodate trucks, trucks may be directed to use the travel lanes.
13. The barrier shown in this typical application is one method that may be used to close a lane for a longterm project.

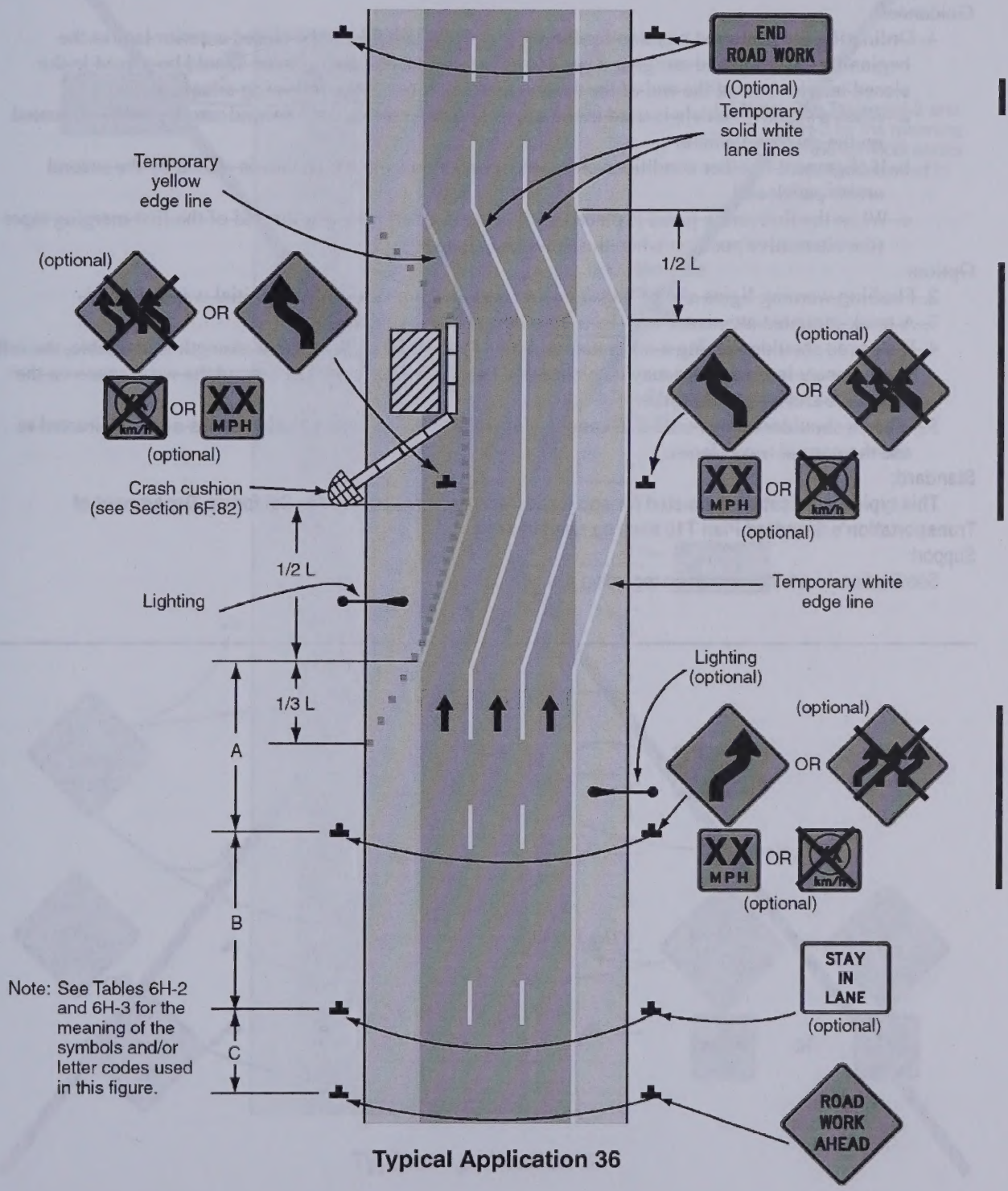
Guidance:

14. The use of a barrier should be based on engineering judgment.

Option:

15. Type C Steady-Burn warning lights may be placed on channelizing devices and the barrier parallel to the edge of pavement for nighttime lane closures.
16. Detail 11 (see Figure 3A-102(CA)) may be used instead of the temporary solid white lane line, which is shown in Figure 6H-36.

Figure 6H-36. Lane Shift on Freeway (TA-36)



Typical Application 36

~~Notes for Figure 6H-37 Typical Application 37~~

~~Double Lane Closure on Freeway~~

~~Guidance:~~

~~1. Ordinarily, the preferred position for the second arrow panel is in the closed exterior lane at the beginning of the second merging taper. However, the second arrow panel should be placed in the closed interior lane at the end of the second merging taper in the following situations:~~

~~a. When a shadow vehicle is used in the interior closed lane, and the second arrow panel is mounted on the shadow vehicle;~~

~~b. If alignment or other conditions create any confusion as to which lane is closed by the second arrow panel; and~~

~~c. When the first arrow panel is placed in the closed exterior lane at the end of the first merging taper (the alternative position when the shoulder is narrow).~~

~~Option:~~

~~2. Flashing warning lights and/or flags may be used to call attention to the initial warning signs.~~

~~3. A truck-mounted attenuator may be used on the shadow vehicle.~~

~~4. If a paved shoulder having a minimum width of 3 m (10 ft) and sufficient strength is available, the left and adjacent interior lanes may be closed and vehicular traffic carried around the work space on the right lane and a right shoulder.~~

~~5. When a shoulder lane is used that cannot adequately accommodate trucks, trucks may be directed to use the normal travel lanes~~.

Standard:

This typical application is deleted for application and shall not be used in California. Department of Transportation's Standard Plan T10 shall be used instead.

Support:

See Section 1A.11 for information regarding this publication.

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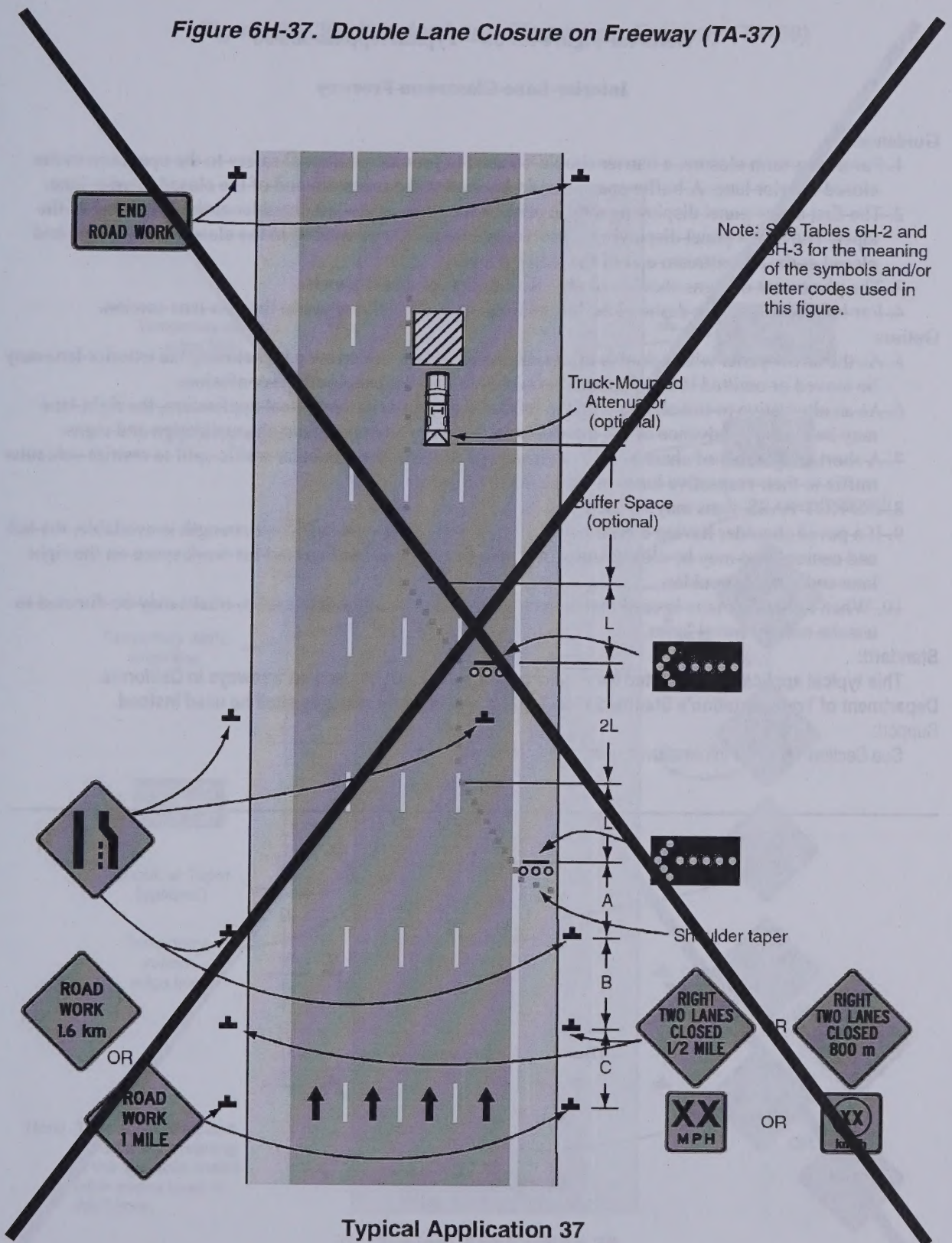
Figure 6H-37. Double Lane Closure on Freeway (TA-37)



Typical Application 37

~~**Notes for Figure 6H-38 Typical Application 38**~~

~~**Interior Lane Closure on Freeway**~~

~~Guidance:~~

~~1. For a long-term closure, a barrier should be used to provide additional safety to the operation in the closed interior lane. A buffer space should be used at the upstream end of the closed interior lane.~~

~~2. The first arrow panel displaying a right arrow should be on the left shoulder at the beginning of the taper. The arrow panel displaying a double arrow should be centered in the closed interior lane and placed at the downstream end of the shifting taper.~~

~~3. The placement of signs should not obstruct or obscure arrow panels.~~

~~4. For long-term use, the dashed lane lines should be made solid white in the two-lane section.~~

~~Option:~~

~~5. As the arrow panel with a double arrow displayed is key, the arrow panel closing the exterior lane may be moved or omitted if the alignment is such that the two panels create confusion.~~

~~6. As an alternative to initially closing the left lane, as shown in the typical application, the right lane may be closed in advance of the interior lane closure with appropriate channelization and signs.~~

~~7. A short, single row of channelizing devices in advance of the vehicular traffic split to restrict vehicular traffic to their respective lanes may be added.~~

~~8. DO NOT PASS signs may be used.~~

~~9. If a paved shoulder having a minimum width of 3 m (10 ft) and sufficient strength is available, the left and center lanes may be closed and motor vehicle traffic carried around the work space on the right lane and a right shoulder.~~

~~10. When a shoulder lane is used that cannot adequately accommodate trucks, trucks may be directed to use the normal travel lanes.~~

Standard:

This typical application is deleted for application and shall not be used on freeways in California. Department of Transportation's Standard Plan T-16 for moving lane closures shall be used instead.

Support:

See Section 1A.11 for information regarding this publication.

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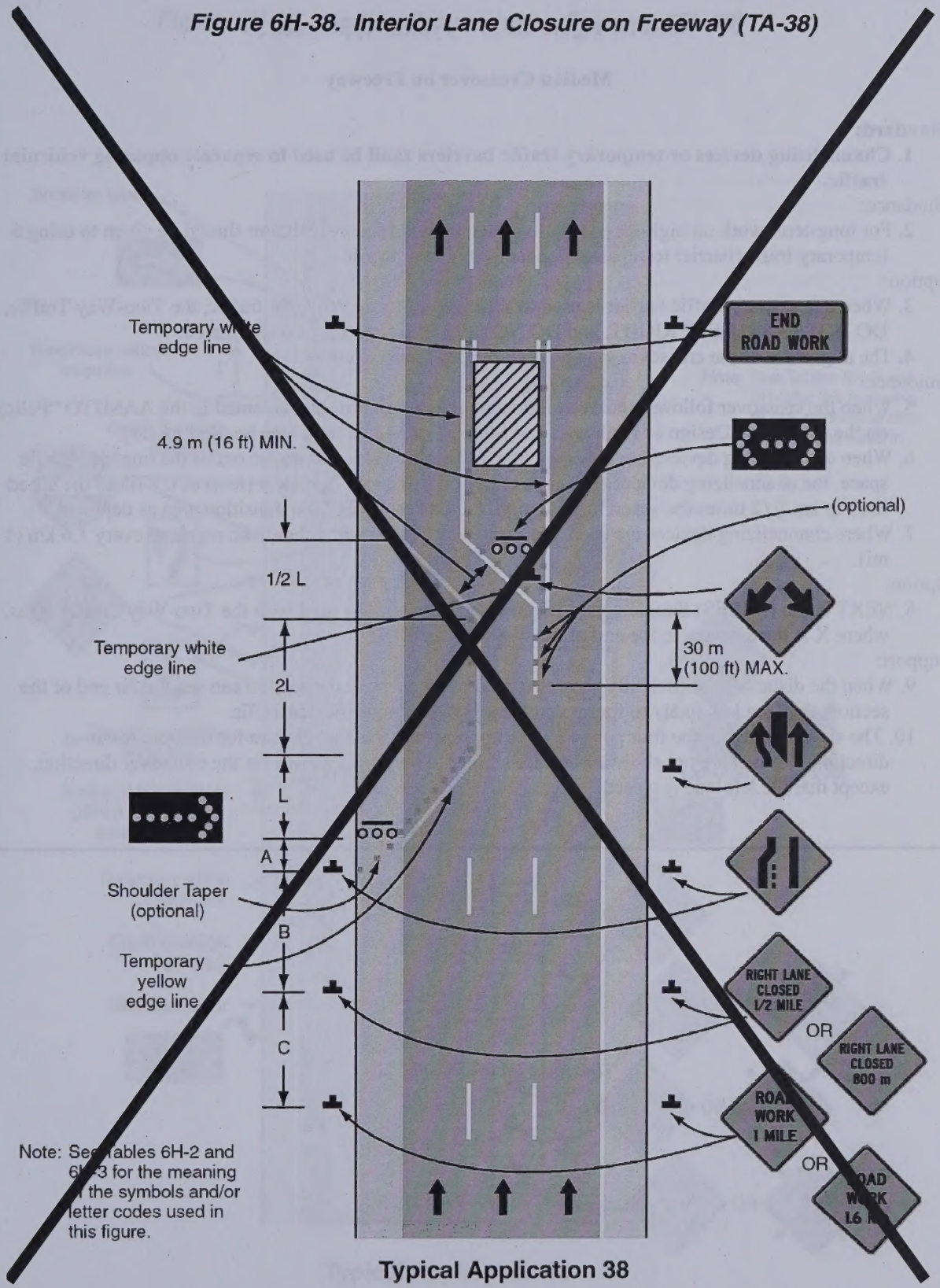
Figure 6H-38. Interior Lane Closure on Freeway (TA-38)



Typical Application 38

Notes for Figure 6H-39—Typical Application 39

Median Crossover on Freeway

Standard:

1. **Channelizing devices or temporary traffic barriers shall be used to separate opposing vehicular traffic.**

Guidance:

2. For long-term work on high-speed, high-volume highways, consideration should be given to using a temporary traffic barrier to separate opposing vehicular traffic.

Option:

3. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic, DO NOT PASS, KEEP RIGHT, and DO NOT ENTER signs may be eliminated.
4. The alignment of the crossover may be designed as a reverse curve.

Guidance:

5. When the crossover follows a curved alignment, the design criteria contained in the AASHTO "Policy on the Geometric Design of Highways and Streets" should be used (see Section 1A.11).
6. When channelizing devices have the potential of leading vehicular traffic out of the intended traffic space, the channelizing devices should be extended a distance in meters (feet) of 0.4 times the speed limit in km/h (2 times the speed limit in mph) beyond the end of the transition area as depicted.
7. Where channelizing devices are used, the Two-Way Traffic signs should be repeated every 1.6 km (1 mi).

Option:

8. NEXT X ~~km~~ (MILES) Supplemental Distance plaques may be used with the Two-Way Traffic signs, where X is the distance to the end of the two-way section.

Support:

9. When the distance is sufficiently short that road users entering the section can see the far end of the section, they are less likely to forget that there is opposing vehicular traffic.
10. The sign legends for the four pairs of signs approaching the lane closure for the noncrossover direction of travel are not shown. They are similar to the series shown for the crossover direction, except that the left lane is closed.

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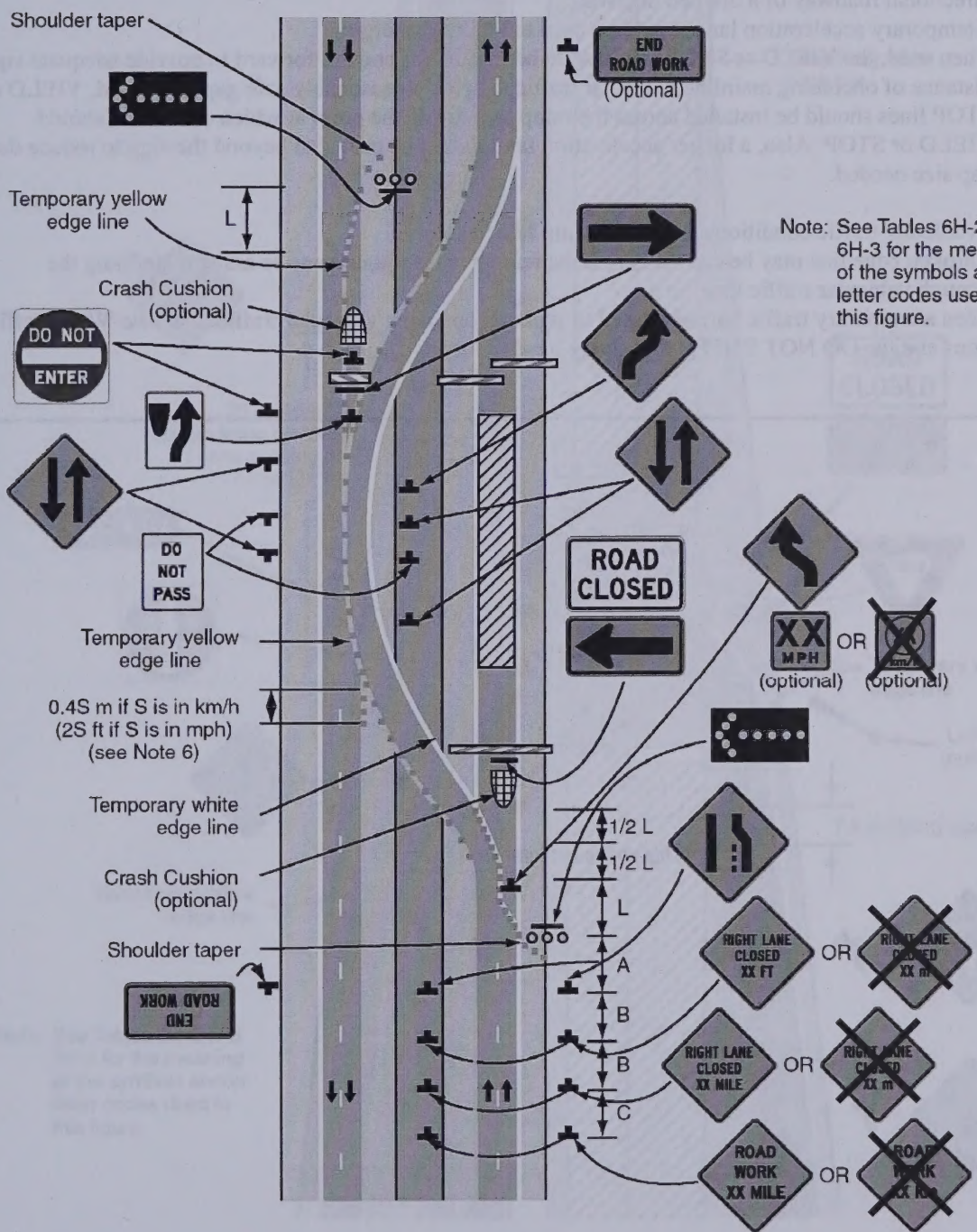
Figure 6H-39. Median Crossover on Freeway (TA-39)



Typical Application 39

Notes for Figure 6H-40—Typical Application 40

Median Crossover for Entrance Ramp

Guidance:

1. The typical application illustrated should be used for carrying an entrance ramp across a closed directional roadway of a divided highway.
2. A temporary acceleration lane should be used to facilitate merging.
3. When used, the YIELD or STOP sign should be located far enough forward to provide adequate sight distance of oncoming mainline vehicular traffic to select a reasonably safe gap. If needed, YIELD or STOP lines should be installed across the ramp to indicate the point at which road users should YIELD or STOP. Also, a longer acceleration lane should be provided beyond the sign to reduce the gap size needed.

Option:

4. If vehicular traffic conditions allow, the ramp may be closed.
5. A broken edge line may be carried across the temporary entrance ramp to assist in defining the through vehicular traffic lane.
6. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic signs and the DO NOT ENTER signs may be eliminated.

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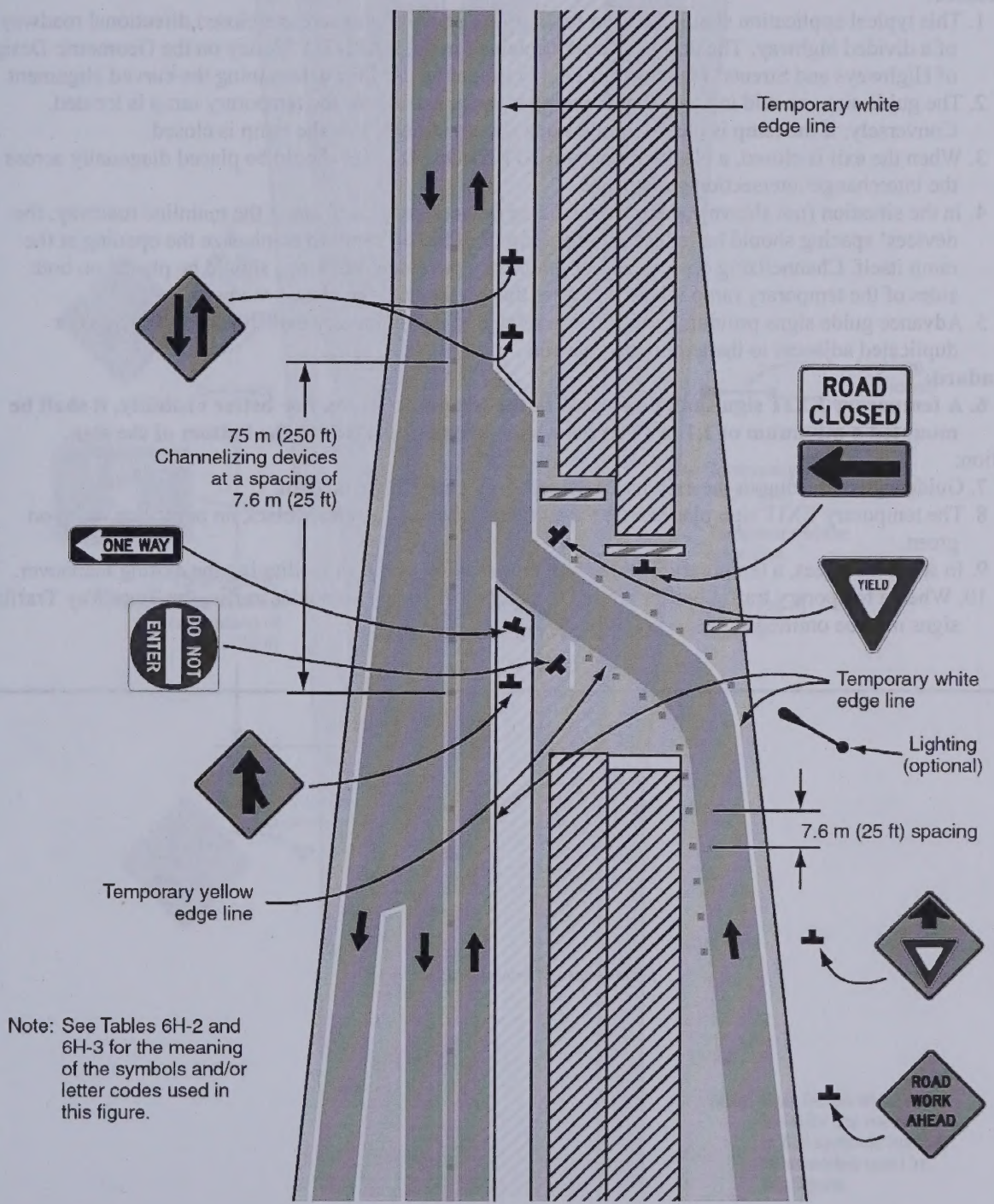
Figure 6H-40. Median Crossover for Entrance Ramp (TA-40)


Temporary white edge line
ROAD CLOSED
75 m (250 ft) Channelizing devices at a spacing of 7.6 m (25 ft)
ONE WAY
DO NOT ENTER
YIELD
Temporary white edge line
Lighting (optional)
7.6 m (25 ft) spacing
Temporary yellow edge line
ROAD WORK AHEAD
Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 40

Notes for Figure 6H-41—Typical Application 41

Median Crossover for Exit Ramp

Guidance:

1. This typical application should be used for carrying an exit ramp across a closed directional roadway of a divided highway. The design criteria contained in the AASHTO "Policy on the Geometric Design of Highways and Streets" (see Section 1A.11) should be used for determining the curved alignment.
2. The guide signs should indicate that the ramp is open, and where the temporary ramp is located. Conversely, if the ramp is closed, guide signs should indicate that the ramp is closed.
3. When the exit is closed, a black on orange EXIT CLOSED panel should be placed diagonally across the interchange/intersection guide signs.
4. In the situation (not shown) where channelizing devices are placed along the mainline roadway, the devices' spacing should be reduced in the vicinity of the off ramp to emphasize the opening at the ramp itself. Channelizing devices and/or temporary pavement markings should be placed on both sides of the temporary ramp where it crosses the median and the closed roadway.
5. Advance guide signs providing information related to the temporary exit should be relocated or duplicated adjacent to the temporary roadway.

Standard:

6. **A temporary EXIT sign shall be located in the temporary gore. For better visibility, it shall be mounted a minimum of 2.1 m (7 ft) from the pavement surface to the bottom of the sign.**

Option:

7. Guide signs referring to the exit may need to be relocated to the median.
8. The temporary EXIT sign placed in the temporary gore may be either black on orange or white on green.
9. In some instances, a temporary deceleration lane may be useful in facilitating the exiting maneuver.
10. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic signs may be omitted.

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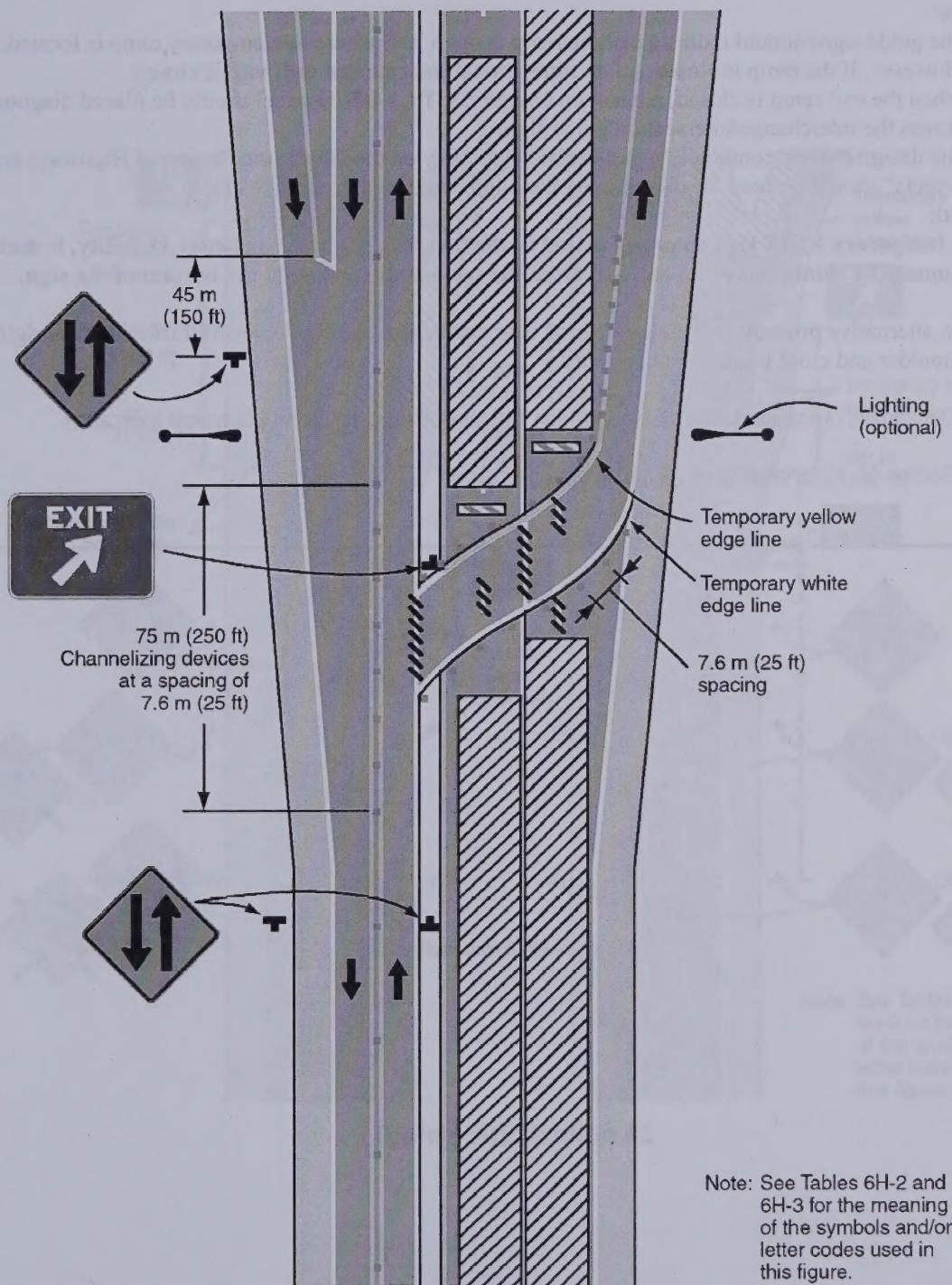
Figure 6H-41. Median Crossover for Exit Ramp (TA-41)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 41

Notes for Figure 6H-42—Typical Application 42

Work in Vicinity of Exit Ramp

Guidance:

1. The guide signs should indicate that the ramp is open, and where the temporary ramp is located. However, if the ramp is closed, guide signs should indicate that the ramp is closed.
2. When the exit ramp is closed, a black on orange EXIT CLOSED panel should be placed diagonally across the interchange/intersection guide signs.
3. The design criteria contained in the AASHTO "Policy on the Geometric Design of Highways and Streets" should be used for determining the alignment (see Section 1A.11).

Standard:

4. A temporary EXIT sign shall be located in the temporary gore. For better visibility, it shall be mounted a minimum of 2.1 m (7 ft) from the pavement surface to the bottom of the sign.

Option:

5. An alternative procedure that may be used is to channelize exiting vehicular traffic onto the right shoulder and close the lane as necessary.

Option:

The Department of Transportation's Standard Plan T10 may be used instead of this typical application.

Support:

See Section 1A.11 for information regarding this publication.

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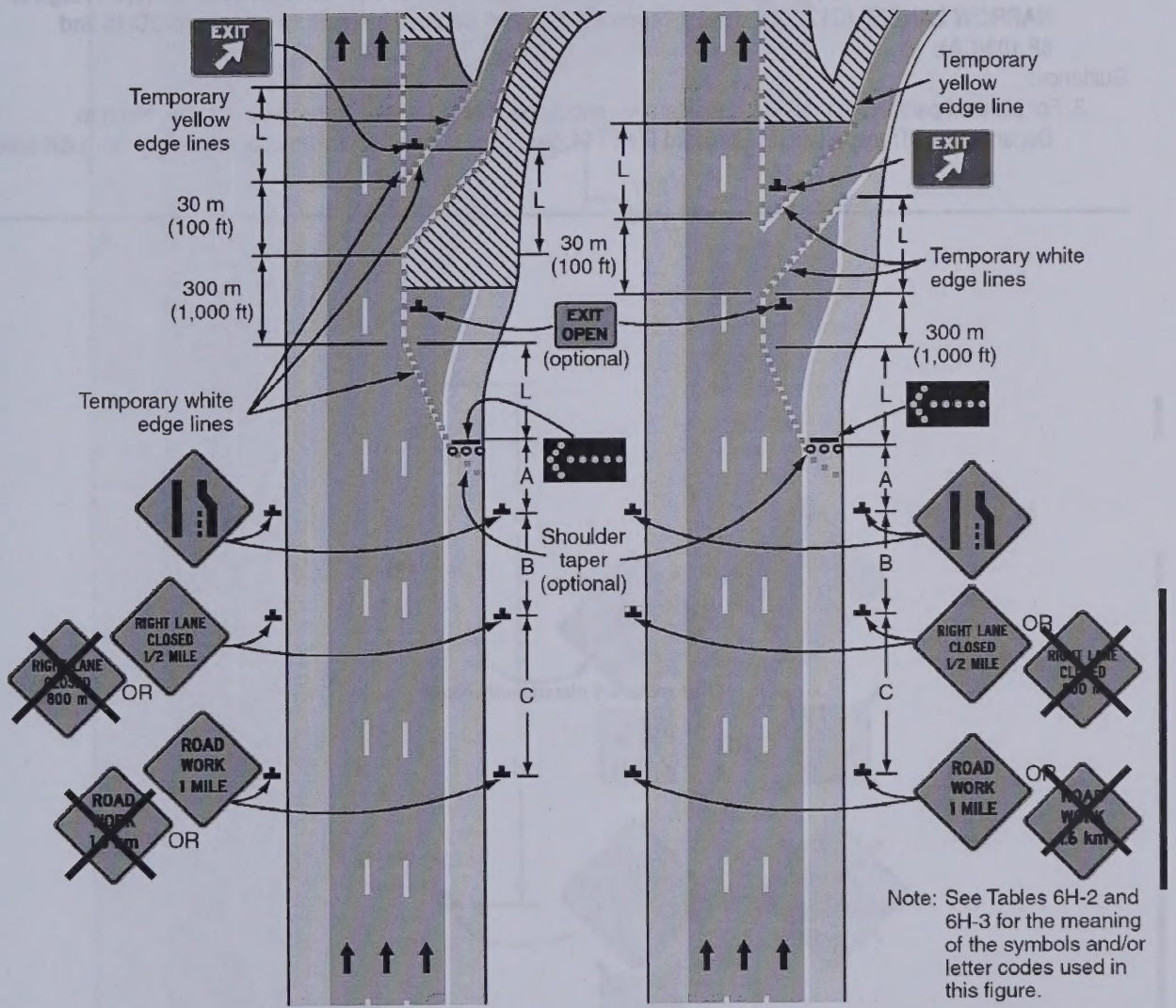
Figure 6H-42. Work in Vicinity of Exit Ramp (TA-42)



Typical Application 42

Notes for Figure 6H-43—Typical Application 43

Partial Exit Ramp Closure

Guidance:

1. Truck off-tracking should be considered when determining whether the minimum lane width of 3 m (10 ft) is adequate (see Section 6G.07).

Standard:

2. The RAMP NARROWS (W5-4) sign shall not be used in California. The ROAD NARROWS (W5-1) sign or NARROW LANE(S) (C12(CA)) sign, as appropriate, shall be used instead. See Sections 2C.15 and 6F.103(CA).

Guidance:

3. For planned partial ramp closure, consideration should be given to closing the entire exit ramp. Refer to Department of Transportation's Standard Plan T14. See Section 1A.11 for information regarding this publication.

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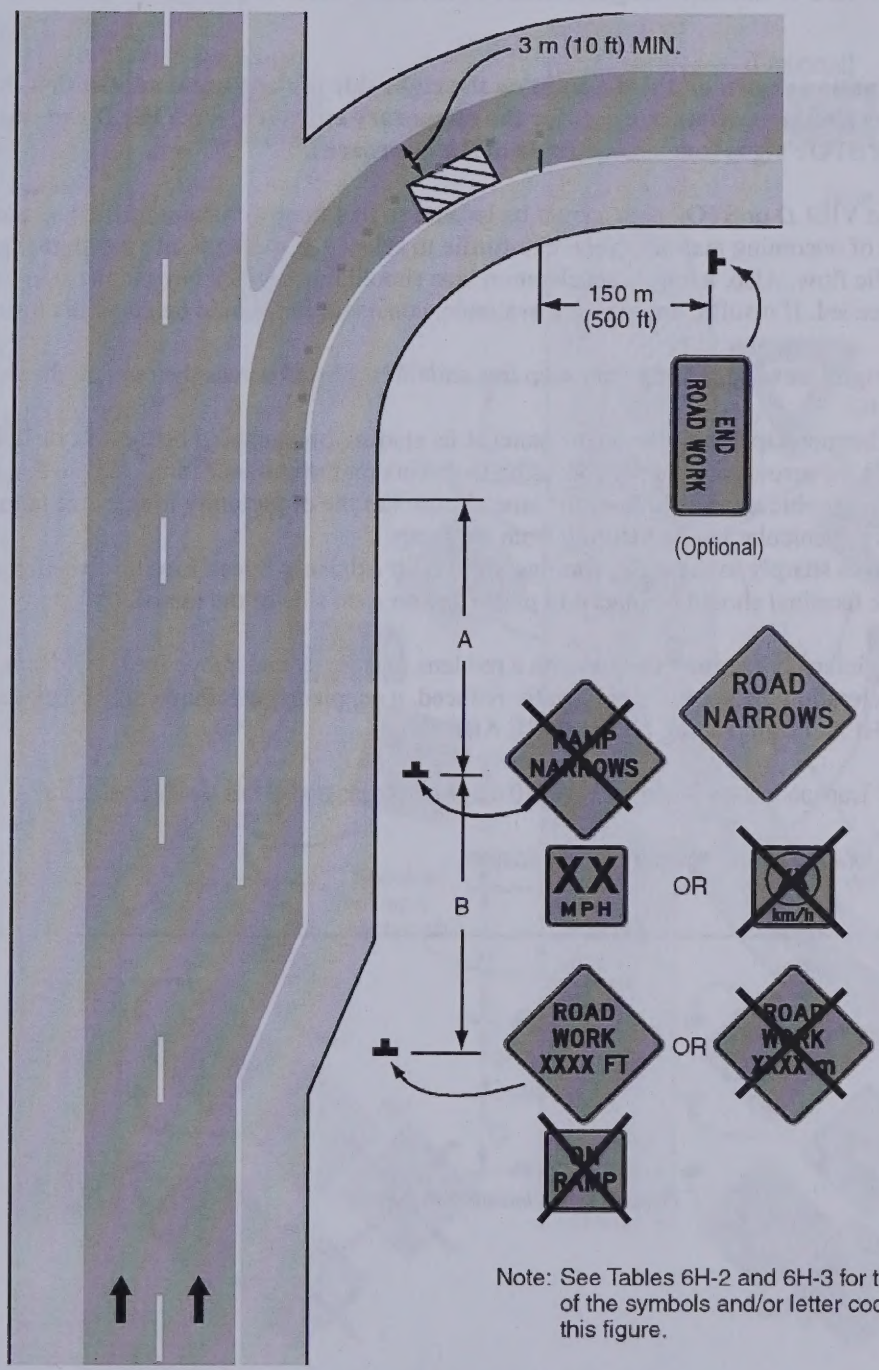
Figure 6H-43. Partial Exit Ramp Closure (TA-43)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 43

Notes for Figure 6H-44—Typical Application 44

Work in Vicinity of Entrance Ramp

Guidance:

1. An acceleration lane of sufficient length should be provided whenever possible as shown on the left diagram.

Standard:

2. For the information shown on the diagram on the right side of the typical application, where inadequate acceleration distance exists for the temporary entrance, the YIELD sign shall be replaced with STOP signs (one on each side of the approach).

Guidance:

3. When used, the YIELD or STOP sign should be located so that ramp vehicular traffic has adequate sight distance of oncoming mainline vehicular traffic to select a reasonably safe gap in the mainline vehicular traffic flow. Also, a longer acceleration lane should be provided beyond the sign to reduce the gap size needed. If insufficient gaps are available, consideration should be given to closing the ramp.
4. Where STOP signs are used, a temporary stop line should be placed across the ramp at the desired stop location.
5. The mainline merging taper with the arrow panel at its starting point should be located sufficiently in advance so that the arrow panel is not confusing to drivers on the entrance ramp, and so that the mainline merging vehicular traffic from the lane closure has the opportunity to stabilize before encountering the vehicular traffic merging from the ramp.
6. If the ramp curves sharply to the right, warning signs with Advisory Speed Limits located in advance of the entrance terminal should be placed in pairs (one on each side of the ramp).

Option:

7. A Type B high-intensity warning flasher with a red lens may be placed above the STOP sign.
8. Where the acceleration distance is significantly reduced, a supplemental plaque may be placed below the YIELD AHEAD sign reading NO MERGE AREA.

Option:

The Department of Transportation's Standard Plan T10 may be used instead of this typical application.

Support:

See Section 1A.11 for information regarding this publication.

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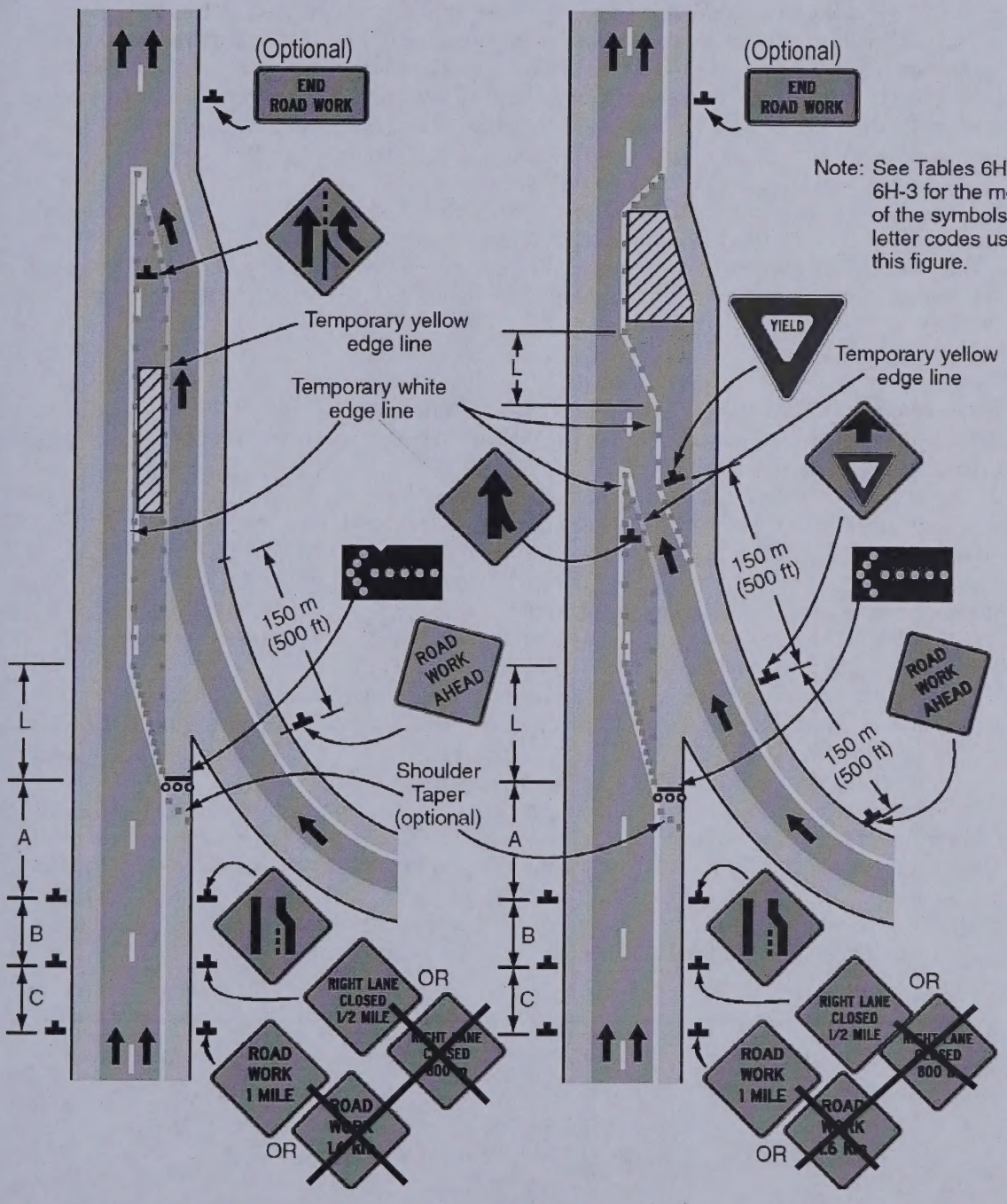
Figure 6H-44. Work in Vicinity of Entrance Ramp (TA-44)



Typical Application 44

Notes for Figure 6H-45—Typical Application 45

Temporary Reversible Lane Using Movable Barriers

Support:

1. This application addresses one of several uses for movable barriers in highway work zones. In this example, one side of a 6-lane divided highway is closed to perform the work operation, and vehicular traffic is carried in both directions on the remaining 3-lane roadway by means of a median crossover. To accommodate unbalanced peak-period vehicular traffic volumes, the direction of travel in the center lane is switched to the direction having the greater volume, with the transfer typically being made twice daily. Thus, there are four vehicular traffic phases described as follows:
   a. Phase A—two travel lanes northbound and one lane southbound;
   b. Transition A to B—one travel lane in each direction;
   c. Phase B—one travel lane northbound and two lanes southbound; and
   d. Transition B to A—one travel lane in each direction.

   The typical application on the left illustrates the placement of devices during Phase A. The typical application on the right shows conditions during the transition (Transition A to B) from Phase A to Phase B.

Guidance:

2. For the reversible-lane situation depicted, the ends of the movable barrier should terminate in a protected area or a crash cushion should be provided. During Phase A, the transfer vehicle should be parked behind the end of the movable barrier. During Phase B, the transfer vehicle should be parked behind the end of the movable barrier.

   The transition shift from Phase A to B should be as follows:
   a. Change the signs in the northbound advance warning area and transition area from a LEFT LANE CLOSED AHEAD to a LEFT TWO LANES CLOSED AHEAD. Change the mode of the second northbound arrow panel from Caution to Right Arrow.
   b. Place channelizing devices to close the northbound center lane.
   c. Move the transfer vehicle from south to north to shift the movable barrier from the west side to the east side of the reversible lane.
   d. Remove the channelizing devices closing the southbound center lane.
   e. Change the signs in the southbound transition area and advance warning area from a LEFT TWO LANES CLOSED AHEAD to LEFT LANE CLOSED AHEAD. Change the mode of the second southbound arrow panel from Right Arrow to Caution.
3. Where the lane to be opened and closed is an exterior lane (adjacent to the edge of the traveled way or the work space), the lane closure should begin by closing the lane with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the transfer vehicle should travel against vehicular traffic. The merging taper should be removed in a method similar to a stationary lane closure.

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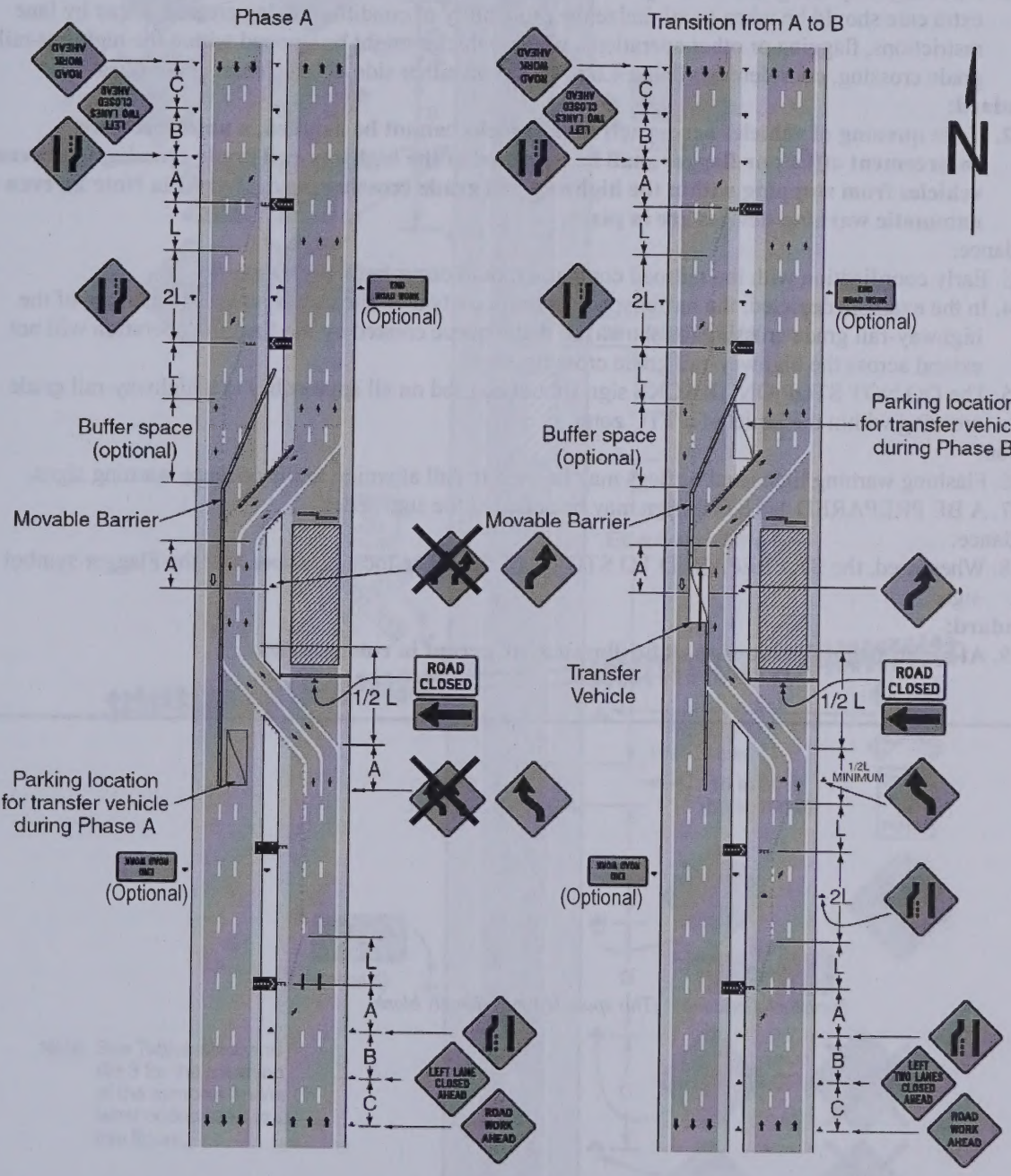
Figure 6H-45. Movable Barriers (TA-45)



Typical Application 45

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure. Although leader lines point to signs on the right side of roadway, most signs should be installed on both sides of roadway.

Notes for Figure 6H-46—Typical Application 46

Work in Vicinity of Highway-Rail Grade Crossing

Guidance:

1. When highway-rail grade crossings exist either within or in the vicinity of roadway work activities, extra care should be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing, considered as being 4.6 m (15 ft) on either side of the closest and farthest rail.

Standard:

2. If the queuing of vehicles across active rail tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing (as described in Note 1), even if automatic warning devices are in place.

Guidance:

3. Early coordination with the railroad company should occur before work starts.
4. In the example depicted, the buffer space of the activity area should be extended upstream of the highway-rail grade crossing (as shown) so that a queue created by the flagging operation will not extend across the highway-rail grade crossing.
5. The DO NOT STOP ON TRACKS sign should be used on all approaches to a highway-rail grade crossing within the limits of a TTC zone.

Option:

6. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
7. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

8. When used, the BE PREPARED TO STOP sign should be located ~~before~~ after the Flagger symbol sign.

Standard:

9. At night, flagger stations shall be illuminated, except in emergencies.

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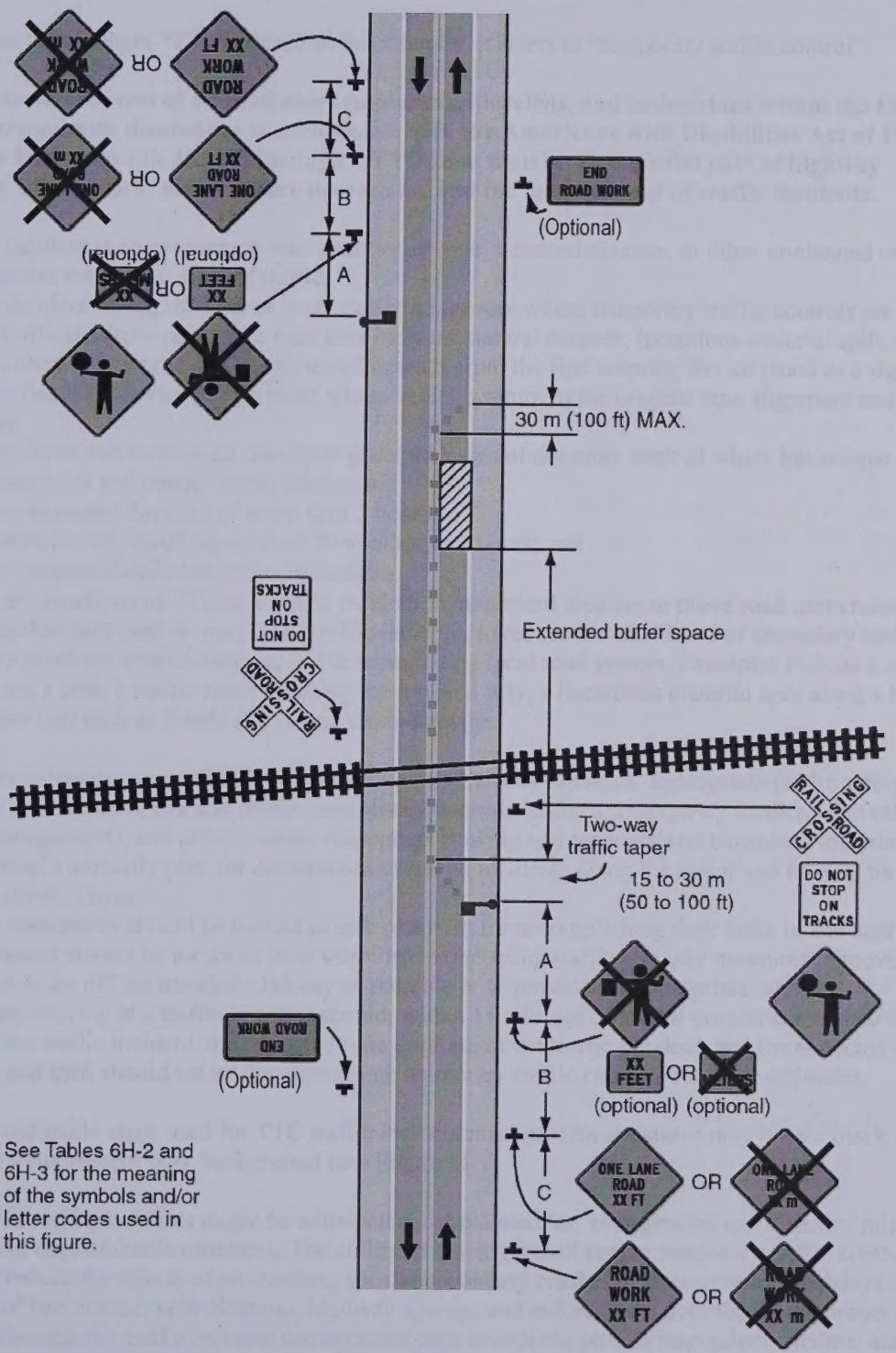
Figure 6H-46. Work in Vicinity of Highway-Rail Grade-Crossing (TA-46)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 46

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CHAPTER 6I. CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

Section 6I.01 General

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

A traffic incident management area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of TTC zone and extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where vehicles return to the original lane alignment and are clear of the incident.

Traffic incidents can be divided into three general classes of duration, each of which has unique traffic control characteristics and needs. These classes are:

A. Major—expected duration of more than 2 hours;

B. Intermediate—expected duration of 30 minutes to 2 hours; and

C. Minor—expected duration under 30 minutes.

The primary functions of TTC at a traffic incident management area are to move road users reasonably safely and expeditiously past or around the traffic incident, to reduce the likelihood of secondary traffic crashes, and to preclude unnecessary use of the surrounding local road system. Examples include a stalled vehicle blocking a lane, a traffic crash blocking the traveled way, a hazardous material spill along a highway, and natural disasters such as floods and severe storm damage.

Guidance:

In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Responders arriving at a traffic incident should, within 15 minutes of arrival on-scene, estimate the magnitude of the traffic incident, the expected time duration of the traffic incident, and the expected vehicle queue length, and then should set up the appropriate temporary traffic controls for these estimates.

Option:

Warning and guide signs used for TTC traffic incident management situations may have a black legend and border on a fluorescent pink background (see Figure 6I-1).

Support:

While some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders, victims, and other personnel at the site while providing reasonably safe traffic flow. These operations might need corroborating legislative authority for the implementation and enforcement of appropriate road user regulations, parking

controls, and speed zoning. It is desirable for these statutes to provide sufficient flexibility in the authority for, and implementation of, TTC to respond to the needs of changing conditions found in traffic incident management areas.

Option:

For traffic incidents, particularly those of an emergency nature, TTC devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.

Section 6I.02 Major Traffic Incidents

Support:

Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.

Guidance:

If the traffic incident is anticipated to last more than 24 hours, applicable procedures and devices set forth in other Chapters of Part 6 should be used.

Support:

A road closure can be caused by a traffic incident such as a road user crash that blocks the traveled way. Road users are usually diverted through lane shifts or detoured around the traffic incident and back to the original roadway. A combination of traffic engineering and enforcement preparations is needed to determine the detour route, and to install, maintain or operate, and then to remove the necessary traffic control devices when the detour is terminated. Large trucks are a significant concern in such a detour, especially when detouring them from a controlled-access roadway onto local or arterial streets.

During traffic incidents, large trucks might need to follow a route separate from that of automobiles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous material might need to follow a different route from other vehicles.

Some traffic incidents such as hazardous material spills might require closure of an entire highway. Through road users must have adequate guidance around the traffic incident. Maintaining good public relations is desirable. The cooperation of the news media in publicizing the existence of, and reasons for, traffic incident management areas and their TTC can be of great assistance in keeping road users and the general public well informed.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by interagency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for all major traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic control devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.03 Intermediate Traffic Incidents

Support:

Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by interagency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for intermediate traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.04 Minor Traffic Incidents

Support:

Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles.

Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Guidance:

When a minor traffic incident blocks a travel lane, it should be removed from that lane to the shoulder as quickly as possible.

Section 6I.05 Use of Emergency-Vehicle Lighting

Support:

The use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. It is often confusing to road users, especially at night. Road users approaching the traffic incident from the opposite direction on a divided facility are often distracted by emergency-vehicle lighting and slow their vehicles to look at the traffic incident posing a hazard to themselves and others traveling in their direction.

The use of emergency-vehicle lighting can be reduced if good traffic control has been established at a traffic incident scene. This is especially true for major traffic incidents that might involve a number of emergency vehicles. If good traffic control is established through placement of advanced warning signs and

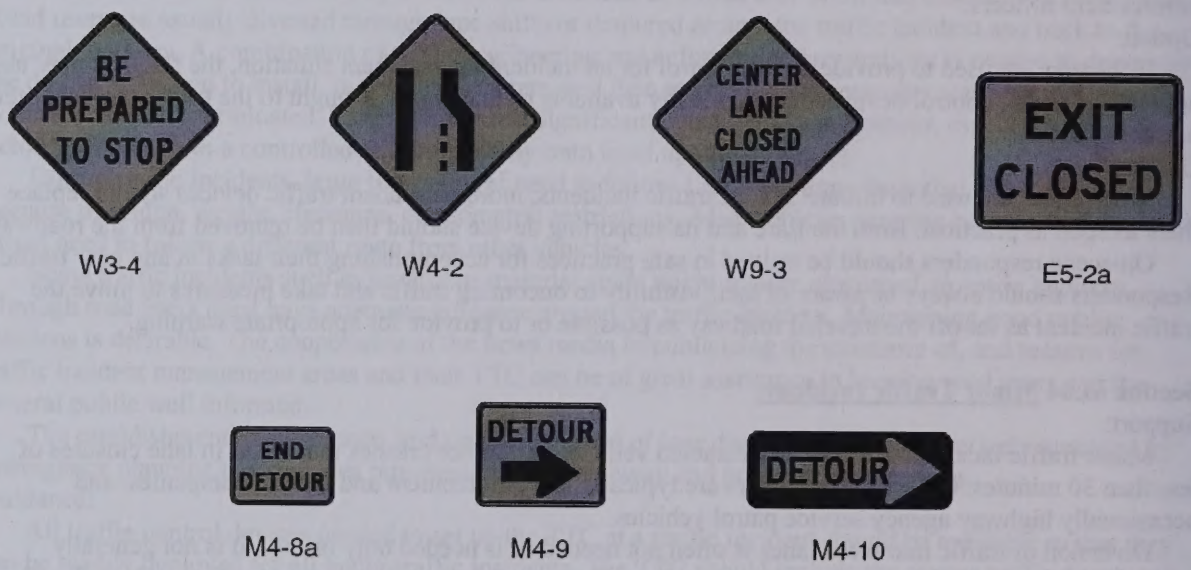
traffic control devices to divert or detour traffic, then public safety agencies can perform their tasks on scene with minimal emergency-vehicle lighting.

Guidance:

Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to on-coming road users.

Vehicle headlights not needed for illumination, or to provide notice to other road users of the incident response vehicle being in an unexpected location, should be turned off at night.

Figure 6I-1. Examples of Traffic Incident Management Area Signs



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Eldorado-Ivanpah Transmission Project

Delineation of Waters of the United States and California Department of Fish and Game Jurisdictional Habitats

Delineation of Waters of the United States and California Department of Fish and Game Jurisdictional Habitats for the Eldorado-Ivanpah Transmission Project San Bernardino County, California and Clark County, Nevada

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Revised
April 18, 2011

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1.0 Introduction

Southern California Edison (SCE) is proposing to construct the Eldorado-Ivanpah Transmission Project (EITP) to service proposed solar generation facilities near the California-Nevada border near Primm, Nevada. The project will consist of the replacement of a 35-mile portion of an existing SCE 115kV transmission line between the proposed Ivanpah Substation and the existing SCE Eldorado Substation near Boulder City, Nevada, upgrading the support facilities at the Eldorado Substation to accommodate the connection of the new transmission lines, and construction of a telecommunications line (telecom line) to connect the project to existing SCE telecommunications systems.

This report presents the findings of a delineation of Waters of the United States and California Department of Fish and Game Jurisdictional Habitats for the SCE-proposed EITP project. The information presented in this report is intended to assist the U.S. Army Corps of Engineers (USACE) with determination of the extent of jurisdictional Waters of the U.S. within the proposed project area. Data have been collected in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and additional supplemental manuals (USACE 1987, 2008a, and 2008b). This report is also intended to aid the California Department of Fish and Game (CDFG) with determination of the extent of jurisdictional habitats in the California portion of the project.

The findings of this revised report have been updated to reflect the Jurisdictional Determination for the Project features issued by USACE in letters dated December 16, 2010 and March 1, 2011 under identification number SPK-2010-00576-SG (USACE 2010; USACE 2011).

2.0 Project Description

Transmission line

The transmission line rebuild involves the removal of the existing 115kV transmission line and installation of a new double-circuit 220kV transmission line between the proposed Ivanpah Substation and the existing Eldorado Substation. Due to differences in the tower heights and span lengths for the new line, new towers will not generally be sited in the same location as the original towers, with the exception of corner points and the part of the route through the McCullough Range where the locations are limited by topography and adjacent transmission lines. New spurs roads will be required for some of the new towers since the existing towers have no spur roads (they were built in 1930-31). However, the majority of the transmission line is located within 30 to 40 feet of the main access road.

Permanent impacts include the placement of towers in new locations (including provisions to maintain 25 foot clearance around tower legs for most sites, or pouring cement footings in Ivanpah Lake) and establishing spur roads. Temporary impacts include: 115kV tower removal areas and conductor pulling sites; new 115kV steel pole installation (around the Ivanpah

Substation), conductor pulling, splicing, and tensioning areas; 220kV tower installation areas, conductor pulling, tensioning, and splicing sites; laydown and staging areas for equipment and supplies; and, temporary access routes. The site for the proposed Ivanpah Substation will be graded and fenced by the proponent of the Ivanpah Solar Electric Generating System (ISEGS) and the impacts associated with the substation site are addressed as part of the environmental review process for the ISEGS project.

The total length of the transmission line route is approximately 36 linear miles. In total, construction of this portion of the project will result in approximately 384 acres temporary impacts and approximately 41 acres of permanent impacts within the project alignment.

Telecommunication line

Two separate and redundant telecommunication paths are required for the project. The first telecom line will be OPGW (optical ground wire) on the new 220kV transmission line, and the second telecom line will be comprised of OPGW on the existing Eldorado-Lugo 500kV transmission line from Eldorado Substation to Nipton Road (Highway 164) where it will then be undergrounded along the north side of Nipton Road to the town of Nipton, California. Installing the OPGW on the 500kV line will require some towers (approximately 45 towers) to be reinforced. All towers on the Eldorado-Lugo line have existing access roads. At Nipton, the telecom line extends north approximately 0.6 miles to a new microwave tower, and then by microwave to the Ivanpah Substation. The microwave site at Nipton will also require installing a wood pole distribution line for power.

Permanent impacts include: underground vault locations for the underground fiber optic cable; wood distribution pole locations; and, the microwave site. Temporary impacts include: OPGW pulling, splicing, and tensioning locations and work areas around those towers that require retrofitting; underground fiber optic cable installation, pulling and splicing areas; installation of wood poles and conductors for the distribution line.

The total length of the proposed telecommunication line route is approximately 30 linear miles. In total, construction of this portion of the project will result in up to approximately 27 acres of temporary impacts and up to approximately 0.25 acres of permanent impacts across all habitat types within the alignment.

Substations

Grading and contouring for the proposed Ivanpah Substation site will be done by the company building the solar generating station and will permitted separately. Substation construction will take place within the substation footprint with the exception of poles or towers required to bring the transmission lines into the substation. Construction at Eldorado Substation will take place within the existing fenced substation area.

2.1 Project Location

The proposed project is located in the Mojave Desert in eastern San Bernardino County, California, and Clark County Nevada (Figure 1). The project is predominantly located on land managed by the Bureau of Land Management (BLM). In California, the project spans Township 16N Ranges 14E and 16E, and Township 17N Ranges 14E and 15E. In Nevada, the project spans Township 27S Ranges 59E, 61E and 62E; Township 26S Ranges 59E, 60E, and 62E; Township 25S Ranges 59E, 60E, 61E, and 62E; and Township 28S Ranges 60E and 61E. One segment of the project (the 35-mile long transmission line) runs from the proposed Ivanpah substation 7 miles west of the California-Nevada border to the existing Eldorado Substation near Boulder City, Nevada. The second segment of the project (the telecom line) runs from the Eldorado Substation southwest to Highway 164, and then proceeds west paralleling the highway to the town of Nipton (Figure 1).

The Ivanpah Substation site and associated transmission line can be accessed off Interstate 15 at Yates Well Road and off East Primm Boulevard near Primm. The Eldorado Substation and portions of the transmission and telecom lines can be accessed from Interstate 95 south of Boulder City. The southern portion of the telecom line can be accessed directly from Highway 164, and the central portions can be accessed from existing dirt roads north of Highway 164 approximately 5.5 miles east of Nipton.

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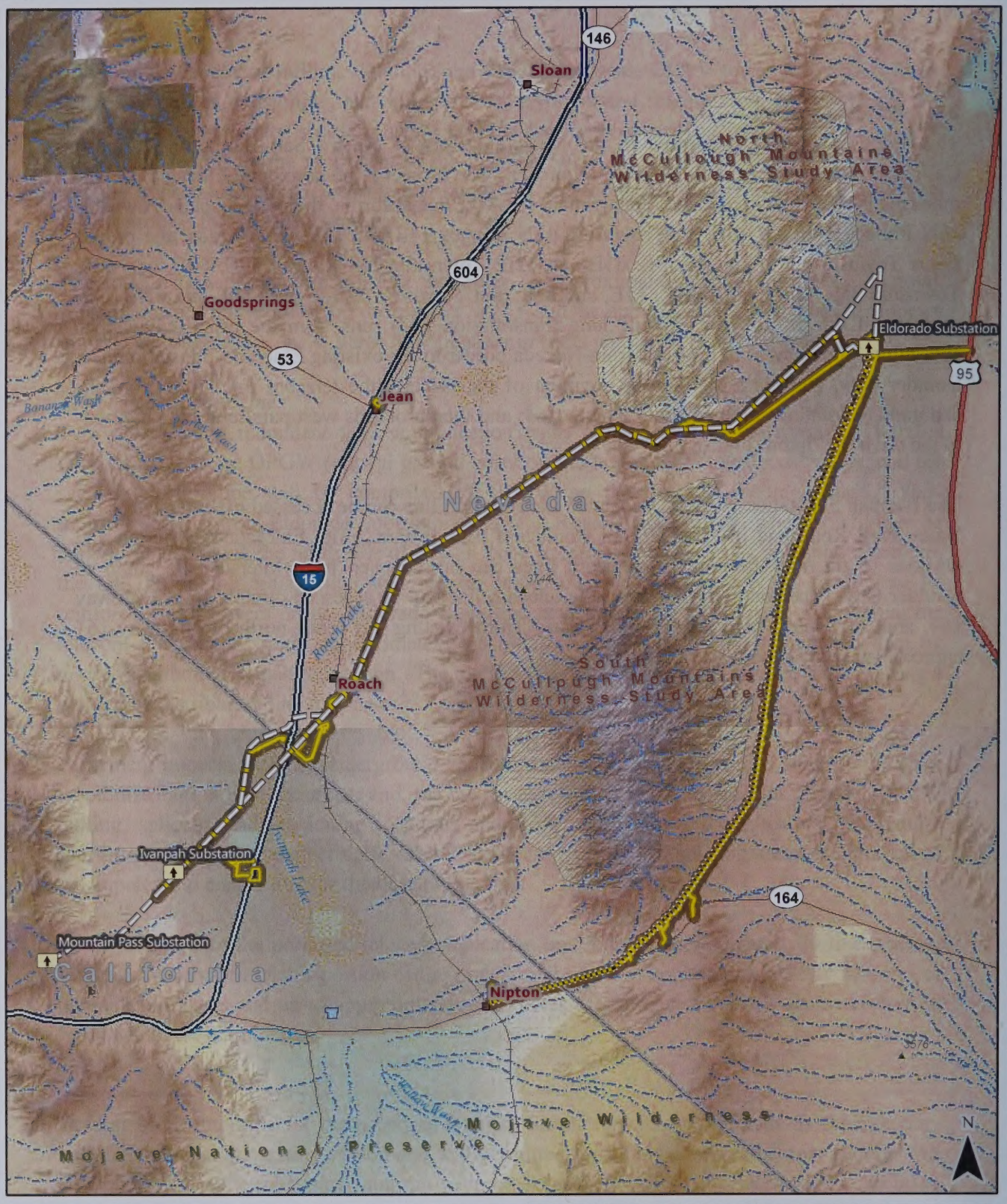


Figure 1. Project location.

2.2 Environmental Setting

The project starts on an alluvial fan in the Ivanpah Valley at an elevation of approximately 1,000 meters. The transmission line crosses Ivanpah Lake and then runs along the eastern edge of Roach Lake before turning east and ascending another large complex of alluvial fans. The transmission line peaks at approximately 3,400 feet elevation as it crosses the McCullough Mountain Range before descending the east side of the range to the Eldorado Substation at approximately 1,800 feet. From the Eldorado Substation, the telecom line ascends a bajada within the Eldorado Valley and runs south between the McCullough Mountain Range and the Highland Range before turning southwest and crossing the hilly, southern extent of the McCullough Range. The line then parallels Highway 164 and descends another bajada through the town of Nipton. A large portion of the project is located on alluvial fans, or bajadas that are crossed by ephemeral wash drainages.

2.2.1 Climate

The hot, dry climate of the project site is typical of the Mojave Desert region. The area receives less than 10 inches (250 mm) of rain a year on average, mostly occurring during the winter months, though thunderstorms often occur during the summer. Precipitation can be highly variable from place to place within the Mojave Desert. Flash floods are a common occurrence when precipitation events occur, contributing to the extensive formation of alluvial fans throughout the region.

Summer daily high temperatures can often exceed 100°F with lows in the 70°F range. On average, the region experiences 300 sunny days per year with no measurable precipitation. Summers are dry, but thunderstorms occasionally develop in July and August. Pacific storms produce some rainfall during the winter months, however the Sierra Nevada mountain range produces a barrier to moisture (rain shadow effect), contributing to the dry climate of the region. Winter daily high temperatures average near 60°F and can fall as low as 20°F on valley floors and below 0°F at higher elevations, however during long periods between storms, valley temperatures can reach 80°F. Windy conditions are very common throughout the region. Winds over 50 mph can occur associated with thunderstorms. Prevailing wind direction in the area is typically from the southwest.

Although precipitation can vary widely over short distances in the Mojave Desert area, the National Oceanic and Atmospheric Association (NOAA) reported 2009 as the 8th driest year on record for Las Vegas, receiving only 1.59 inches of rain. However, by the time field work began on this project on February 15, Las Vegas had received 2.71 inches of rain in 2010 (the most significant storms during this time period were: 1.7 inches between January 20 and 23; 0.34 inches on January 27; 0.36 inches on February 6; and 0.13 inches on February 10) (NOAA 2010).

2.2.2 Hydrology

The majority of the project area falls within the Great Basin Watershed region (NDEP 2009), which does not have an outlet to the ocean. The California portion of the project falls within the Ivanpah Unit of the South Lahontan Hydrologic region (CalWater 1999). The project site drains to a series of dry lakes: Ivanpah Lake (mostly in California), and Roach, Jean, and Eldorado Lakes (all in Nevada). A small portion of the project is in the Piute Wash Watershed, which drains to the Lower Colorado River. Surface water is only present within the project area in response to storm events, and ground water is generally deeper than 80 inches (NRCS 2006 and 2007).

2.2.3 Vegetation

The project area crosses six distinct habitat types: Desert Saltbush Scrub (DSS), Joshua Tree Woodland (JTW), Mojave Creosote Bush Scrub (MCBS), Mojave Desert Wash Scrub (MDWS), Rabbitbrush Scrub (RS), and ruderal. With the exception of Joshua Tree Woodland and Rabbitbrush Scrub, all habitat types are found in both California and Nevada (JTW and RS are only found in Nevada within the project boundary). Each habitat type is described briefly below.

Desert Saltbush Scrub – California and Nevada

The washes near the dry lake margins of Ivanpah Lake and Roach Lake are dominated by Desert Saltbush Scrub. Desert Saltbush Scrub corresponds to the Holland type of the same name (Holland 1986) and corresponds to the *Atriplex polycarpa* Shrubland Alliance (Allscale scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Desert Saltbush Scrub is composed of low, widely spaced shrubs with much bare ground in between, strongly dominated by a single *Atriplex* species. Sites supporting Desert Saltbush Scrub are typically found surrounding playas, and are generally characterized by fine-textured, poorly drained soils with high alkalinity. Allscale (*Atriplex polycarpa*) is the dominant species, and creosote bush (*Larrea tridentata*), and white bursage (*Ambrosia dumosa*) are common associates. Cheesebush (*Hymenoclea salsola*) and galleta grass (*Pleuraphis rigida*) were frequently observed in this habitat type within the project area. Two species of cacti, buckhorn cholla (*Opuntia acanthocarpa*) and beavertail pricklypear (*Opuntia basilaris*) are also observed.

Joshua Tree Woodland - Nevada

The higher elevation habitats near the southern extent of the McCullough Range are dominated by Joshua Tree Woodland. Joshua Tree Woodland corresponds to the Holland (1986) type of the same name and corresponds to the *Yucca brevifolia* Woodland Alliance of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Joshua Tree Woodland is an open woodland type habitat with Joshua tree (*Yucca brevifolia*) as the only arborescent species, and numerous shrub species between 1 and 4 meters tall. There is little or no herbaceous understory during the majority of the year. Dominant plant forms of this habitat type include

evergreen trees and shrubs, deciduous shrubs, and succulents. Sites are generally characterized by well-drained alluvial soils, and this habitat is primarily found on gentle alluvial fans, ridges, and moderate slopes within the project area. The dominant plant species of this association are Joshua tree, blackbrush (*Coleogyne ramosissima*), white bursage, wooly bursage (*Ambrosia eriocentra*), catclaw acacia (*Acacia greggii*), desert almond (*Prunus fasciculata*), cheesebush, and California buckwheat (*Eriogonum fasciculatum* var. *polifolium*). Other common species encountered in this habitat within the project boundary were snakeweed (*Gutierrezia* sp.), banana yucca (*Yucca baccata*), Mojave yucca (*Yucca schidigera*), Nevada ephedra (*Ephedra nevadensis*), Anderson's desert thorn (*Lycium andersonii*), desert sage (*Salvia dorrii*), Apache plume (*Fallugia paradoxa*) buckhorn cholla, and bladdersage (*Salazaria mexicana*).

Mojave Creosote Bush Scrub – California and Nevada

Many of the alluvial fan and valley areas of the project site are dominated by Mojave Creosote Bush Scrub. Mojave Creosote Bush Scrub corresponds to the Holland (1986) type of the same name, and corresponds to the *Larrea tridentata* Shrubland Alliance (Creosote bush scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Mojave Creosote Bush Scrub is an open, shrub-dominated habitat type composed of shrubs less than 3 meters tall, with an open, intermittent, seasonal herbaceous layer. This vegetation type generally occurs on alluvial fans, bajadas, upland slopes, and on minor washes. Soils are well drained, sometimes with desert pavement. Creosote bush is the dominant in this community, with white bursage as a co-dominant. Additional species encountered in this habitat type within the project area include galletta grass, littleleaf ratany (*Krameria erecta*), pencil cholla (*Opuntia ramosissima*), allscale, buckhorn cholla, Mojave yucca, and Nevada ephedra.

Mojave Desert Wash Scrub – California and Nevada

The majority of the larger washes on the project site were dominated by Mojave Desert Wash Scrub. Mojave Desert Wash Scrub corresponds to the Holland (1986) type of the same name, and for some washes corresponds to the *Acacia greggii* Shrubland Alliance (Catclaw acacia thorn scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Mojave Desert Wash Scrub is a diverse scrubby association found typically in sandy arroyos, washes, and bajadas. Soils are coarse and well drained. The shrub canopy is generally less than 3 meters high, open to intermittent, and herbaceous cover is sparse with seasonal annuals. The dominant species in this community are cheesebush, catclaw acacia, white bursage, wooly bursage, creosote bush, and Mojave rabbitbrush (*Chrysothamnus paniculatus*). Other common species include Parish's goldeneye (*Viguiera parishii*), sweetbush (*Bebbia juncea*), California buckwheat, spiny senna (*Senna armata*), buckhorn cholla, bladdersage, Nevada ephedra, pencil cholla, and littleleaf ratany.

Rabbitbrush Scrub - Nevada

Portions of the project area are dominated by Rabbitbrush Scrub, which corresponds to the Holland (1986) type of the same name. Rabbitbrush Scrub also corresponds with the *Ericameria paniculata* Shrubland Alliance (Black-stemmed rabbitbrush scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). (*Ericameria paniculata* is the revised name for *Chrysothamnus paniculatus*). Rabbitbrush scrub is an association dominated by rabbitbrush, generally 1 meter tall, with fairly even spacing between shrubs. Soils are generally well drained, coarse to fine sand. The dominant species in this association include Mojave rabbitbrush, cheesebush, and catclaw acacia with white bursage, shortleaf baccharis (*Baccharis brachyphylla*), spiny senna, wooly bursage, creosote bush, California buckwheat, and Nevada ephedra.

Ruderal – California and Nevada

There is a small section within the project area that has been classified as Ruderal. This habitat may correspond to the Tamarisk Scrub association of Holland (1986) and the *Tamarix* spp. Semi-natural Shrubland Stands (Tamarisk thickets) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). This habitat association is generally found in arroyos, ditches, washes, and other watercourses. On the project site, this habitat consists of what appears to be a periodically maintained drainage ditch long the parking lot of the Primm Valley casinos. The area is vegetated with sparse tamarisk (*Tamarix* sp.) shrubs, and Russian thistle (*Salsola tragus*). This area is directly adjacent to the Ivanpah Lake margin; sparse allscale and creosote bush are present in addition to the non-native invasive species.

2.3 Soils

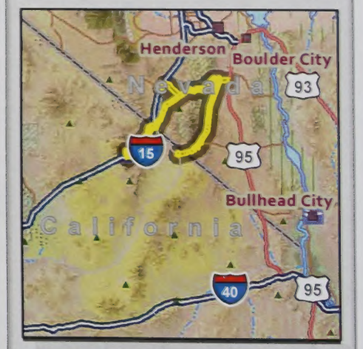
The project area crosses numerous soil types (Figure 2). Information was not available for all project areas. Some areas of Clark County do not have soils data available (NRCS 2006), and mapping has not yet been completed for the Mojave Desert Area. Brief descriptions of each soil type are presented below. Where given, soil colors follow the Munsell Soil Colors Chart.

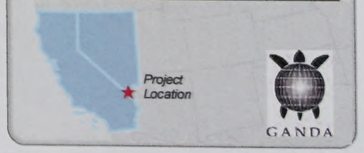
Figure 2. Soil mapping units.

Survey area

Soil Mapping Units

- Arizo association- 450
- Arizo loamy sand, 2 to 8 percent slopes- 3520
- Arizo-Cafetal association- 400
- Arizo-Lanfair-Riverwash association - 710
- Birdspring association- 850
- Bluepoint association- 192
- Colosseum Association, 2 to 4 percent slopes- 3660
- Haleburu-Hiddensun association - 754
- Hoppswell-Ustidur association- 690
- Hypoint gravelly sandy loam, 0 to 4 percent slopes- 150
- Lanfair-Hoppswell association- 680
- Nippeno-Newera association- 801
- Orwash-Arizo-Lanip association - 622
- Peskah-Arizo association- 4180
- Peskah-Arizo association- 651
- Popups sandy loam, 4 to 30 percent slopes- 4122
- Prisonear fine sand, 2 to 8 percent slopes- 780
- Tipnat-Bluepoint-Hypoint association - 391
- Tonopah-Arizo association- 380
- Typic Haplosalids, 0 to 2 percent slopes- 4703
- Unmapped areas- NOTCOM
- Weiser Association- 315
- Weiser association, 2 to 8 percent slopes- 3650
- Weiser-Oldspan-Wechech association - 313
- Weiser-Threelakes association- 311





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Arizo Association - California and Nevada
The Arizo series consists of very deep, excessively drained soils that formed in mixed alluvium. Arizo soils develop on recent alluvial fans, inset fans, fan aprons, fan skirts, stream terraces, and floodplains of intermittent streams and channels. Slopes range from 0 to 15 percent. Arizo soils with sandy loam and loam surface textures have moderate to very rapid permeability. The surface horizon (0 to 8 inches) is light brownish gray (10YR 6/2) very gravelly fine sand (dark grayish brown (10YR 4/2) moist), with a weak coarse platy structure and moderate alkalinity (pH 8.2). Below 8 inches the soil is light brownish gray (10YR 6/2) extremely gravelly sand (dark grayish brown (10YR 4/2) moist) with moderate alkalinity (pH 8.2).

Arizo Loamy Sand, 2 to 8 Percent Slopes - California
Arizo loamy sands form on fan aprons from metamorphic and sedimentary derived alluvium and are excessively drained. The top 0-2 inches are loamy sand, with gravelly sand below 2 inches.

Colosseum Association, 2 to 4 percent slopes - California
The Colosseum Association consists of deep, somewhat excessively drained soils that formed in alluvium derived from limestone and dolomite. Colosseum soils are found on fan aprons and drainageways. Slopes range from 2 to 4 percent. The typical profile for the Colosseum series is 0 to 1 inch pale brown (10YR 6/3) fine sandy loam, (brown (10YR 5/3) moist) with moderate thick platy structure and moderate alkalinity (pH 8.2). From 1 to 4 inches pale brown (10YR 6/3) gravelly loamy sand, (brown (10YR 5/3) moist) with weak fine subangular blocky structure with moderate alkalinity (pH 8.2). From 4 to 45 inches the soil is pale brown (10YR 6/3) extremely gravelly loamy sand, (brown (10YR 5/3) moist) with massive structure and moderate alkalinity (pH 8.4). From 45 to 59 inches the soil is light yellowish brown (10YR 6/4) very gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with massive parting to weak medium subangular blocky structure and moderate alkalinity (pH 8.4).

Copperworld Association, 30 to 60 percent slopes - California
The Copperworld series consists of very shallow or shallow to bedrock, somewhat excessively drained soils that formed in residuum and colluvium from metamorphic rocks. Copperworld soils are on mountains. Slopes range from 30 to 60 percent. The surface 0 to 1 inches is gravelly sandy loam, dark yellowish brown (10YR 3/4) moist with weak medium platy structure and a neutral pH (pH 7.2). From 1 to 6 inches the soil is gravelly sandy loam, dark brown (10YR 3/3) moist, with massive parting to weak fine subangular blocky structure and slight alkalinity (pH 7.4). Below 6 inches is indurate metamorphic bedrock.

Copperworld-Lithic Ustic Haplargids Association, 30 to 60 percent slopes - California
The Copperworld-Lithic Ustic Haplargids Association consists of shallow, somewhat excessively drained soil formed from residuum and colluviums derived from metamorphic rock. These soils are found on mountains, and slopes range from 30 to 60 percent. The typical profile

for this series is 0 to 1 inches: very gravelly loamy coarse sand; 1 to 7 inches: very gravelly sandy clay loam; below 7 inches: bedrock.

Peskah-Arizo Association – California and Nevada
The Peskah series consists of deep to a duripan, well drained soils that formed in alluvium derived from volcanic rocks. Peskah soils are on fan remnants. Slopes range from 2 to 8 percent. The surface 0 to 1 inch is pale brown (10YR 6/3) extremely gravelly fine sandy loam, (brown (10YR 4/3) moist) with moderate thin and medium platy structure and is moderately alkaline (pH 8.2). From 1 to 4 inches the soil is very pale brown (10YR 7/3) gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong thick platy structure and moderate alkalinity (pH 8.4). From 4 to 8 inches the soil is strong brown (7.5YR 5/6) gravelly sandy clay loam, (strong brown (7.5YR 4/6) moist) with strong fine and medium subangular blocky structure and moderate alkalinity (pH 8.2). The Arizo series has been described above.

Playas – California and Nevada
The playas are composed of lacustrine deposits and are very poorly drained. Ponding is frequent, and slopes range from 0 to 1 percent. The typical playa profile is 0 to 6 inches: Silty clay loam; 6 to 60 inches: Clay. Playa soils are included on the National Hydric Soils List.

Popups Sandy Loam, 4 to 30 percent slopes - California
The Popups series consists of moderately deep, well drained soil over duripan derived from mixed alluvium. The typical profile is 0 to 2 inches, brown (10YR 5/3) very gravelly sandy loam, (dark brown (10YR 3/3) moist) with weak medium platy structure and slight alkalinity (pH 7.6). From 2 to 12 inches the soil is yellowish brown (10YR 5/4) gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak medium subangular blocky structure and a slightly alkaline pH (pH 7.6). From 12 to 33 inches the soil is light brown (7.5YR 6/4) gravelly sandy loam, (brown (7.5YR 4/4) moist) with moderate coarse subangular blocky structure, and is moderately alkaline (pH 8.0). From 33 to 60 inches the soil is very pale brown (10YR 8/2) weakly cemented duripan (pale brown (10YR 6/3) moist) with massive structure.

Typic Haplosalids, 0 to 2 percent slopes - California
The Typic Haplosalids are somewhat poorly drained lacustrine deposits derived from volcanic and sedimentary rock and are found on playas. These soils occasionally pond. A typical profile is 0 to 1 inches: Clay loam; 1 to 8 inches: Clay loam; 8 to 59 inches: Loam.

Weiser Association – California and Nevada
The Weiser series consists of very deep, well drained soils that formed in alluvium from limestone and dolomite. Weiser soils are on fan remnants and inset fans. Slopes range from 2 to 8 percent. The surface horizon (0 to 2 inches) is very pale brown (10YR 7/3) extremely gravelly loam, (dark yellowish brown (10YR 4/4) moist) with strong very thick platy structure and is

moderately alkaline (pH 8.4). From 2 to 10 inches the soil is light yellowish brown (10YR6/4) gravelly loam, (dark yellowish brown (10YR 4/4) moist) with weak medium subangular blocky structure and is moderately alkaline (pH 8.4).

Arizo-Cafetal Association - Nevada

The Arizo-Cafetal Association consists of deep, excessively drained soils that form in mixed alluvium often derived from basalt and andesite. Arizo-Cafetal soils form on inset fans and fan remnants. Slopes range from 2 to 8 percent. The typical profile for the Arizo is 0 to 4 inches: Extremely stony sandy loam; 4 to 60 inches: Stratified very gravelly loamy sand to extremely stony coarse sand. The typical profile for the Cafetal is 0 to 3 inches, pale brown (10YR 6/3) extremely stony loam, (brown (10YR 4/3) moist) with strong thin and medium platy structure and moderate alkalinity (pH 8.4). From 3 to 13 inches the soil is light brown (7.5YR 6/4) very cobbly loam, (brown (7.5YR 4/4) moist) with moderate fine and medium subangular blocky structure and a moderately alkaline pH (pH 8.4). From 13 to 22 inches the soil is pink (7.5YR 7/4) extremely stony loam, (brown (7.5YR 5/4) moist) with massive structure and a strongly alkaline pH (pH 8.6). From 22 to 38 inches the soil is pale brown (10YR 6/3) stratified extremely cobbly loam to loamy sand, (dark yellowish brown (10YR 4/4) moist) with massive structure and moderate alkalinity (pH 8.4). From 38 to 60 inches the soil is pale brown (10YR 6/3) extremely cobbly coarse sandy loam, (dark yellowish brown (10YR 4/4) moist) with massive structure and is moderately alkaline (pH 8.4).

Arizo-Lanfair-Riverwash Association - Nevada

The Arizo-Lanfair-Riverwash Association consists of deep, excessively drained soils that form in mixed alluvium on inset fans, fan remnants, and drainage ways. Slopes range from 2 to 8 percent. The Arizo series is described above. The typical profile for Lanfair is 0 to 2 inches, pale brown (10YR 6/3) extremely gravelly sandy loam, (brown (10YR 4/3) moist) with weak thick platy structure and is moderately alkaline (pH 8.4). From 2 to 9 inches the soil is light yellowish brown (10YR 6/4) gravelly sandy loam, (brown (10YR 4/3) moist) with moderate medium subangular blocky structure and is moderately alkaline (pH 8.4). From 9 to 15 inches the soil is yellowish brown (10YR 5/4) very gravelly sandy loam, (brown (10YR 4/3) moist) with moderate fine subangular blocky structure and is moderately alkaline (pH 8.4). From 15 to 26 inches the soil is light yellowish brown (10YR 6/4) very gravelly coarse sand, (brown (10YR 4/3) moist) with massive structure and is moderately alkaline (pH 8.4). From 26 to 60 inches the soil is pale brown (10YR 6/3) very gravelly coarse sand, (dark yellowish brown (10YR 4/4) moist) with massive structure and is moderately alkaline (pH 8.4). The typical profile for Riverwash series is 0 to 6 inches: extremely gravelly coarse sand; 6 to 60 inches: stratified extremely gravelly coarse sand to gravelly sand.

Birdspring Association - Nevada
The Birdspring series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluvium from limestone and dolomite. Birdspring soils occur on mountains. Slopes range from 8 to 75 percent. The surface horizon (0 to 1 inch) is very pale brown (10YR 7/3) extremely gravelly fine sandy loam (brown (10YR 5/3) moist) with moderate thick platy structure and moderate alkalinity (pH 8.2). The lower horizon (1 to 4 inches) is very pale brown (10YR 7/3) very gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with weak medium subangular blocky structure and moderate alkalinity (pH 8.4). Below 4 inches is hard limestone bedrock.

Bluepoint Association - Nevada
The Bluepoint series consists of very deep, somewhat excessively drained soils that formed in eolian materials from mixed rock sources. Bluepoint soils are on dunes and sand sheets (and on the playas within the project boundary). Slopes range from 0 to 30 percent. The Surface horizon (0 to 2 inches) is very pale brown (10YR 7/3) fine sand, (brown (10YR 5/3) moist) with moderate thin and medium platy structure and moderate alkalinity (pH 8.2). From 2 to 14 inches the soil is very pale brown (10YR 7/3) fine sand, (brown (10YR 5/3) moist) with weak, very thick platy structure (due to stratification), and is moderately alkaline (pH 8.0).

Haleburu-Hiddensun Association - Nevada
The Haleburu series consists of shallow (and very shallow) to bedrock, well drained soils that formed in colluvium and residuum from mainly volcanic sources. The Haleburu soils are on mountains and hills. Slopes range from 4 to 75 percent. The surface horizon (0 to 2 inches) is pale brown (10YR 6/3) extremely gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with moderate medium platy structure and moderate alkalinity (pH 8.4). From 2 to 8 inches the soil is pale brown (10YR 6/3) very gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak subangular blocky structure and moderate alkalinity (pH 8.4). The Hiddensun series consists of somewhat shallow, well drained soils that formed in residuum weathered from volcanic rock influenced by calcareous loess. Hiddensun soils are found in mountains. Slopes range from 8 to 30 percent. The typical Hiddensun profile is 0 to 3 inches: very gravelly fine sandy loam; 3 to 15 inches: very cobbly fine sandy loam; 15 to 25 inches: Bedrock.

Hoppswell-Ustidur Association - Nevada
The Hoppswell series consists of very deep, well drained soils that formed in alluvium from igneous sources. Hoppswell soils are on fan remnants. Slopes range from 2 to 15 percent. The surface horizon (0 to 2 inches) is brown (7.5YR 5/4) extremely gravelly sandy loam, (dark brown (7.5YR 3/4) moist) with moderate medium and thick platy structure, and moderate alkalinity (pH 8.0). From 2 to 15 inches the soil is yellowish red (5YR 5/6) very gravelly sandy

clay loam, (yellowish red (5YR 4/6) moist) with moderate fine and medium subangular blocky structure and moderate alkalinity (pH 8.0). The Ustidur series consists of shallow, well drained soils formed from alluvium derived from metamorphic rock. Slopes range from 4 to 8 percent. The typical Ustidur profile is 0 to 2 inches: extremely gravelly sandy loam; 2 to 15 inches: very gravelly sandy clay loam; 15 to 64 inches: stratified extremely gravelly coarse sand to very gravelly sandy loam.

Hypoint Gravelly Sandy Loam, 0 to 4 percent slopes - Nevada
The Hypoint series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. Hypoint soils are on fan aprons, fan skirts and alluvial fans. Slopes range from 0 to 4 percent. The surface horizon (0 to 2 inches) is pale brown (10YR 6/3) gravelly sandy loam, (brown (10YR 4/3) moist) with weak medium subangular blocky structure, with a 1/4 inch surface crust and moderate alkalinity (pH 8.4). From 2 to 60 inches the soil is pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) stratified sand to very gravelly coarse sand, (brown (10YR 4/3) and dark yellowish brown (10YR 4/4) moist) and is strongly alkaline (pH 8.6).

Lanfair-Hoppswell Association - Nevada
The Lanfair series consists of very deep, well drained soils that formed in alluvium from metamorphic sources. Lanfair soils are on inset fans or alluvial fans. Slopes range from 2 to 8 percent. The surface horizon (0 to 2 inches) is pale brown (10YR 6/3) extremely gravelly sandy loam, (brown (10YR 4/3) moist) with weak thick platy structure and moderate alkalinity (pH 8.4). From 2 to 9 inches the soil is light yellowish brown (10YR 6/4) gravelly sandy loam, (brown (10YR 4/3) moist) with moderate medium subangular blocky structure and moderate alkalinity (pH 8.4). The Hoppswell Association is described above.

Nippeno-Newera Association - Nevada
The Nippeno series consists of shallow, well drained soils that formed in residuum and colluvium from metamorphic and altered granitic rocks. Nippeno soils are found on mountains. Slopes range from 8 to 50 percent. The surface horizon (0 to 2 inches) is yellowish brown (10YR 5/4) very gravelly loam, (dark yellowish brown (10YR 4/4) moist) with weak fine subangular blocky structure and slight alkalinity (pH 7.6). From 2 to 6 inches the soil is brown (7.5YR 4/4) very gravelly sandy clay loam, (brown (7.5YR 4/4) moist) with moderate fine subangular blocky structure with slight alkalinity (pH 7.6). From 6 to 15 inches is gravel (95 percent angular pebbles). The Newera series is a shallow, somewhat excessively drained soil formed from colluvium and/or residuum weathered from volcanic and metamorphic rock. Newera soils occur on hills. Slopes range from 15 to 50 percent. The typical Newera profile is 0 to 2 inches: extremely gravelly sandy loam; 2 to 6 inches: very gravelly sandy clay loam; 6 to 16 inches: bedrock.

Orwash-Arizo-Lanip Association - Nevada
The Orwash series consists of very deep, somewhat excessively drained soils that formed from mixed alluvium derived from granitic sources. Orwash soils are formed on fan aprons, fan skirts, and alluvial flats. Slopes range from 2 to 8 percent. The surface horizon (0 to 2 inches) is light yellowish brown (10YR 6/4) gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong medium platy structure and moderate alkalinity (pH 8.4). From 2 to 16 inches the soil is light yellowish brown (10YR 6/4) loamy sand, (dark yellowish brown (10YR 4/4) moist) and is strongly alkaline (pH 8.6). The Arizo series is described above. The Lanip series consists of deep, well drained soils formed from mixed alluvium on fan remnants. Slopes range from 2 to 8 percent. The typical Lanip series profile is 0 to 2 inches: gravelly sandy loam; 2 to 15 inches: gravelly loam; 15 to 39 inches: clay loam; 39 to 48 inches: gravelly sandy loam; 48 to 60 inches: very gravelly sandy loam.

Prisonear Fine Sand, 2 to 8 percent slopes - Nevada
The Prisonear series consists of moderately deep to a petrocalcic horizon, somewhat excessively drained soils that formed in eolian sands over alluvium from limestone. Prisonear soils are on sand sheets over fan remnants. Slopes range from 2 to 8 percent. The surface 0 to 3 inches is light brown (7.5YR 6/4) fine sand, (brown (7.5YR 5/4) moist) with moderate medium platy structure and is strongly alkaline (pH 8.8). From 3 to 9 inches the soil is light brown (7.5YR 6/4) fine sand, (brown (7.5YR 5/4) moist) with weak coarse subangular blocky structure and is strongly alkaline (pH 8.8).

Tipnat-Bluepoint-Hypoint Association - Nevada
The Tipnat series consists of very deep, well drained soils that formed in mixed alluvium. The Tipnat soils are on alluvial flats. Slopes range from 0 to 4 percent. The surface 0 to 1 inch is pale brown (10YR 6/3) loamy sand, (brown (10YR 4/3) moist) with strong medium and thick platy structure and is strongly alkaline (pH 8.6). From 1 to 3 inches the soil is light yellowish brown (10YR 6/4) loamy sand, (brown (7.5YR 5/3) moist) with strong alkalinity (pH 8.6). From 3 to 13 inches the soil is light brown (7.5YR 6/4) sandy clay loam, (brown (7.5YR 4/4) moist) with weak medium and coarse prismatic structure parting to moderate medium and thick platy structure and is very strongly alkaline (pH 9.2). The Bluepoint and Hypoint series have been described above.

Tonopah-Arizo Association - Nevada
The Tonopah series consists of very deep, excessively to well drained soils that formed in mixed alluvium. Tonopah soils are on fan remnants and fan piedmonts. Slopes range from 2 to 8 percent. The surface 0 to 1 inch is brown (10YR 5/3) extremely gravelly sandy loam, (dark brown (10YR 4/3) moist) with weak medium platy structure and is moderately alkaline (pH 8.2). From 1 to 8 inches the soil is pale brown (10YR 6/3) very gravelly sandy loam, (dark yellowish

brown (10YR 4/4) moist) with weak fine subangular blocky structure and moderate alkalinity (pH 8.4). The Arizo series has been described above.

Weiser-Oldspan-Wechech Association - Nevada

The Weiser series has been described above. The Oldspan series consists of deep, well drained soils formed from limestone and sandstone derived mixed alluvium. Oldspan soils form on fan remnants. Slopes range from 2 to 8 percent. A typical Oldspan profile is 0 to 3 inches, light yellowish brown (10YR 6/4) gravelly fine sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong thick and very thick platy structure and moderate alkalinity (pH 8.2). From 3 to 10 inches the soil is light yellowish brown (10YR 6/4) fine sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak medium subangular blocky structure and a moderately alkaline pH (pH 8.4). From 10 to 20 inches the soil is light yellowish brown (10YR 6/4) loam, (yellowish brown (10YR 5/4) moist) with weak coarse subangular blocky structure and is moderately alkaline (pH 8.4). From 20 to 40 inches the soil is light yellowish brown (10YR 6/4) stratified extremely gravelly loam to extremely gravelly loamy coarse sand, (yellowish brown (10YR 5/4) moist) with massive structure and is strongly alkaline (pH 9.0). From 40 to 60 inches the soil is light yellowish brown (10YR 6/4) stratified extremely gravelly fine sandy loam to extremely gravelly loamy coarse sand, (dark yellowish brown (10YR 4/4) moist) with massive structure and is strongly alkaline (pH 8.8). The Wechech series consists of shallow, well drained soils formed from limestone and dolomite derived alluvium. Slopes range from 2 to 8 percent. A typical profile for Wechech is 0 to 2 inches, very pale brown (10YR 7/4) very gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong medium platy structure and strong alkalinity (pH 8.6). From 2 to 7 inches the soil is light yellowish brown (10YR 6/4) very gravelly sandy loam, (dark yellowish brown (10YR 4/6) moist) with moderate fine and medium subangular blocky structure and is strongly alkaline (pH 8.6). From 7 to 13 inches the profile is light brown (7.5YR 6/4) very gravelly sandy loam, (brown (7.5YR 5/4) moist) with massive structure and is strongly alkaline (pH 8.6). From 13 to 60 inches the soil is very pale brown (10YR 8/2) indurated petrocalcic hardpan, (very pale brown (10YR 7/3) moist) with massive structure and strong alkalinity (pH 8.8).

Weiser-Threelakes Association - Nevada

The Weiser series has been described above. The Threelakes series consists of very deep, well drained soils that formed in mixed alluvium mainly from limestone. Threelakes soils form on fan aprons. Slope ranges from 2 to 8 percent. From 0 to 3 inches the soils are pale brown (10YR 6/3) extremely gravelly fine sandy loam, (brown (10YR 5/3) moist) with moderate medium subangular blocky structureand are strongly alkaline (pH 8.6). From 3 to 9 inches the soils are pale brown (10YR 6/3) extremely gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with weak fine subangular blocky structure and are strongly alkaline (pH 8.6). From 9 to 31 inches the soils are pale brown (10YR 6/3) extremely gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with massive structure and are strongly alkaline (pH 9.0). From 31 to

60 inches the soils are pale brown (10YR 6/3) stratified extremely gravelly fine sandy loam to extremely gravelly loamy coarse sand, (yellowish brown (10YR 5/4) moist) with massive structure and strong alkalinity (pH 9.0).

2.3.1 Hydric Soils

The majority of the soils in the project area are deep, well drained soils that formed from alluvium. The National Hydric Soils List (NRCS 2010) includes Playas (NRCS 2007) and the Tipnat-Bluepoint-Hypoint series on playas (NRCS 2006) as the only hydric soils present in the project area.

3.0 Delineation of Waters of the United States

3.1 Regulatory Background

Section 404 of the Clean Water Act (33 U.S.C. 1344) requires authorization for all discharges of dredged or fill material in waters of the United States, including jurisdictional wetlands. Waters of the United States are defined in 33 CFR Part 328.3 as:

1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters, which are subject to the ebb and flow of the tide;
2) All interstate waters including interstate wetlands;
3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    (iii)Which are used or could be used for industrial purpose by industries in interstate commerce;
4) All impoundments of waters otherwise defined as waters of the United States under the definition;
5) Tributaries of waters identified in paragraphs (1) through (4) above;
6) The territorial seas;
7) Wetlands adjacent to waters identified in paragraphs (1) through (6) above.

The project is located in a region of the arid Southwest where the dominant hydrologic features are braided ephemeral channels typically located on large alluvial fans which drain into playa lakes that are dry for most of the year. Other than the playa lakes themselves, no wetlands occur within the project area, and jurisdictional features are limited to ephemeral channels meeting one or more of the criteria defining waters of the United States listed above.

In the absence of adjacent wetlands, the extent of the Corps jurisdiction is defined by the "Ordinary High Water Mark" (OHWM). In 33 CFR Part 329.11(a)(1), the "Ordinary High Water Mark" for non-tidal rivers is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. In dryland fluvial systems typical of the desert areas, the most common physical characteristics indicating the OHWM for a channel include, but are not limited to: a clear natural scour line impressed on the bank; recent bank erosion; destruction of native terrestrial vegetation; and the presence of litter and debris (USACE 2001). A complete list of potential geomorphic and vegetation OHWM indicators can be found in USACE (2008b). Drainage features that dissipate into sheet flow, and historic channels that convey flow only during extremely large storm events generally do not fall under Corps jurisdiction (USACE 2001, 2008b).

3.2 Methods

All project-related temporary and permanent potential impact areas, including a 50 ft. buffer surrounding all impact areas and access roads, were surveyed for desert washes potentially falling under the regulatory jurisdiction of USACE. Field investigations were carried out from February 16th through February 27th 2010, during which all project-related temporary and permanent potential impact areas and proposed new access roads were surveyed on foot, and all existing access roads were surveyed either on foot or by vehicle. Washes falling within the survey buffer of access roads were mapped only in cases where the washes crossed the road. The width and depth at ordinary high water mark (OHWM), habitat type, and up to six of the dominant and/or characteristic plant species and their cover were recorded for each drainage feature. Foliar cover was scored on a scale of 1-4 (4= abundant, 3 = common, 2 = scattered, 1 = sparse). A photograph of each mapped feature was taken along with notes on channel characteristics, observations of channel dissipation, and the hydrologic indicators present. All potentially jurisdictional drainage channels with positive OHWM indicators (USACE 1987, 2001, 2007b) were mapped in the field using a Trimble GeoXT GPS unit with sub-meter accuracy. Many washes lacking the channel characteristics indicative of jurisdictional washes were also mapped, and notes justifying their exclusion from consideration as jurisdictional waters were recorded.

Following the field work, the subwatershed and terminal water body of each mapped drainage were determined using the digital hydrologic unit boundary layer data set available from NRCS (2009). Recent Jurisdictional Determinations issued by USACE for this project (USACE 2010; USACE 2011) and other nearby projects (USACE 2009), and communications with USACE staff (Patricia McQueary personal communication) were used to determine the jurisdictional status of the tributaries in each watershed traversed by the project. Tributaries to isolated waters

with no nexus to interstate or foreign commerce were excluded from further consideration as jurisdictional features. All of the remaining mapped features were further analyzed using Geographic Information Systems (GIS) software and high resolution aerial imagery. Drainage features observed to dissipate or otherwise lack connectivity to jurisdictional water bodies were excluded from further consideration. Finally, the total acreage of all potentially jurisdictional features occurring within the maximum limits of potential permanent and temporary project impacts, and in the surrounding buffers was calculated using GIS software.

3.3 Results

3.3.1 Waters of the United States

Determination of Jurisdictional Status

The project area traverses five watersheds in California and Nevada which direct flows toward Ivanpah Lake (CA, NV), Roach Lake (NV), Jean Lake (NV), Eldorado Valley Dry Lake (NV), and Piute Wash (NV), which is a tributary to the Colorado River. The jurisdictional status of the tributaries and central features in each of these watersheds and the rational for their status under Section 404 of the Clean Water Act is summarized in Table 1. The rational is explained further in the paragraphs that follow.

Table 1. Summary of potential USACE jurisdiction by watershed.

Watershed	USACE Status	Section 404 Rational
Ivanpah Lake - Interstate tributaries	Jurisdictional	Interstate waters
Ivanpah Lake Playa	Jurisdictional	Nexus to interstate or foreign commerce
Piute Wash tributaries	Jurisdictional	Nexus to Traditional Navigable Water
Roach Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce
Eldorado Valley Dry Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce
Ivanpah Lake intrastate tributaries	Non-Jurisdictional	Recent determination by USACE
Jean Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce

Ivanpah Lake is the terminal water body for subwatersheds occurring in both California and Nevada. Tributaries to Ivanpah Lake that cross the border between California and Nevada are interstate waters falling under the jurisdiction of USACE. Additionally, the playa surface at Ivanpah Lake is used for land sailing and has been determined to be jurisdictional under the interstate commerce clause of the Clean Water Act (Patricia McQueary personal communication). However, a recent Jurisdictional Determination issued by USACE for proposed solar generating facilities in the Ivanpah Valley found the intrastate tributaries to Ivanpah Lake to be non-jurisdictional (USACE 2009). Therefore, following this precedent, all intrastate tributaries to Ivanpah Lake occurring in the project area are considered non-jurisdictional in this report.

A small portion of the project area in Nevada contains ephemeral drainages that are tributaries to Piute Wash, which is itself a tributary to the Colorado River, a traditional navigable water (TNW). Under guidance issued by USACE Headquarters, non-navigable tributaries of TNWs that typically flow year-round or have continuous flow at least seasonally are considered jurisdictional (USACE 2007). Additionally, jurisdiction is asserted over water bodies that are not relatively permanent if that body is determined to have a significant nexus with a TNW (USACE 2007). In this report it is assumed that the tributaries to Piute Wash have a significant nexus to the Colorado River and therefore would be considered jurisdictional.

Jean Lake, Roach Lake and Eldorado Valley Dry Lake are isolated intrastate playa lakes with no significant nexus to interstate or foreign commerce. Tributaries to these basins are therefore considered non- jurisdictional under the Clean Water Act in this report.

Description of Jurisdictional Features

Two general types of features qualifying as waters of the United States occur within the project area: Ivanpah Lake, a playa lake that is dry for most of the year; and numerous ephemeral desert washes. The portion of Ivanpah Dry Lake that is within the project area is composed of lacustrine deposits that are very poorly drained. Ponding occurs following sufficient rain events, and the lake bed is devoid of vegetation. Surrounding the lake are alkaline soils supporting Desert Saltbush Scrub dominated by allscale and creosote bush.

The project area is dissected by numerous ephemeral desert washes and drainage channels supporting six vegetation communities. A list of the dominant and/or characteristic plant species observed within these features in the proposed project area is presented in Appendix A. Because of the timing of the survey, it was not possible to compile a complete vascular plant species list. About a quarter of the mapped potentially jurisdictional washes exhibit sandy or gravelly unvegetated channel bottoms, and banks with vegetation that is not distinct from the surrounding Mojave Creosote Bush Scrub (Holland 1986), the predominant vegetation type for most of the project area. A majority of the mapped drainage features, however, are vegetated with Mojave Desert Wash Scrub (Holland 1986), which includes species such as cheesebush and catclaw acacia that are indicative of regular surface flows during rain events. Washes near the margins of Roach Lake typically exhibit sandy bottoms and support Desert Saltbush Scrub (Holland 1986). Along the telecommunications route within the watershed north-west of Highway 164 that drains to Piute Wash, the uplands are dominated by Joshua Tree Woodland (Holland 1986), and the margins of many of the mapped drainages, and occasionally the channel bottoms, are also dominated by this same habitat type. Other channels within this area are dominated by species that are more characteristic of active channels such as catclaw acacia, desert almond, and woolly bur-sage. The habitat of one potentially jurisdictional wash in this area was characterized as Rabbitbrush Scrub (Holland 1986), a habitat type that becomes more abundant along the telecommunications route in the watershed that drains to Eldorado Valley Dry Lake. Finally,

several highly degraded drainages that cross the state line near Primm, Nevada, are characterized as ruderal habitat, and are dominated by non-native species such as tamarisk and Russian thistle. Representative photographs of typical washes vegetated with each of the observed habitat types are presented in Appendix B.

3.3.2 Summary of Potentially Jurisdictional Features

Overall, the construction of the project will potentially result in up to 13.450 acres of temporary and up to approximately 0.028 acres of permanent impacts to potential waters of the United States. Potential maximum impacts to all jurisdictional features including the geographic coordinates, the habitat type, and the type of construction impact of each feature, are summarized in Table 2. Maps depicting all potential waters of the United States including waters that lie within areas that may be permanently or temporarily impacted by the construction of the project, and waters occurring within a 50 ft survey buffer surrounding all project construction sites, laydown areas, and access roads, are presented in Appendix C.

Table 2. Summary of impacts to potential USACE – jurisdictional waters.

Feature	Location UTM NAD 83	Watershed	Habitat	OHWM width (ft.)	OHWM depth (ft.)	Permanent impacts (acres)		Temporary Impacts (acres)						Buffer (acres)
						220kV clearance	Microwave tower	115kV tower removal	220 kV P-S-T site	220kV tower const	Fiber optic underground	Fiber optic work area	Laydown areas	
Ivanpah Lk	11S 644475.6 3939582.2	N/A	Playa	N/A	N/A	0.014		3.714	0.689	8.876				
CA-357	11S 656984.5 3926552.9	Ivanpah Lake - Interstate	MDWS	3	1						0.001			0.007
CA-375	11S 657027.2 3926881	Ivanpah Lake - Interstate	MDWS	3	2						0.002			0.018
CA-380	11S 657035.4 3926999.8	Ivanpah Lake - Interstate	MDWS	10	2						0.009			0.039
CA-382	11S 657036.8 3927024.9	Ivanpah Lake - Interstate	MCBS	3	2						0.001			0.006
CA-383	11S 657036.6 3927032.9	Ivanpah Lake - Interstate	MCBS	3.25	1						0.001			0.007
CA-384	11S 657042.9 3927045.4	Ivanpah Lake - Interstate	MCBS	4.5	1						0.002			0.010
CA-389	11S 657034.1 3927135.8	Ivanpah Lake - Interstate	MDWS	9	1.5						0.009			0.040
CA-392	11S 657036.6 3927175.1	Ivanpah Lake - Interstate	MCBS	4.5	4						0.002			0.009
CA-396	11S 657041.2 3927207	Ivanpah Lake - Interstate	MDWS	5	2						0.002			0.011
CA-400	11S 657042.8 3927279.1	Ivanpah Lake - Interstate	MDWS	5	1.5						0.003			0.011
CA-402	11S 657036.9 3927301.2	Ivanpah Lake - Interstate	MDWS	4	1		0.010							0.012
CA-455	11S 645841.9 3941220.6	Ivanpah Lake - Interstate	DSS	7	0.5	0.004		0.012		0.070				0.133
CA-457	11S 645939.3 3941284.3	Ivanpah Lake - Interstate	DSS	4	2									0.004
NV-001	11S 645995.9 3941340.5	Ivanpah Lake - Interstate	ruderal	2.5	3					0.005				0.004
NV-002	11S 646209.5 3941510.6	Ivanpah Lake - Interstate	ruderal	2.5	1.5								0.034	0.003
NV-011	11S 663981.4 3927924.6	Ivanpah Lake - Interstate	MCBS	2.5	1							0.009		0.006
NV-013	11S 663977.6 3927974.9	Ivanpah Lake - Interstate	MDWS	6	1									0.051
NV-014	11S 663969.9 3927983.1	Ivanpah Lake - Interstate	MDWS	3.5	1									0.007
NV-021	11S 664585.8 3928407.2	Ivanpah Lake - Interstate	MDWS	2.5	1									0.006
NV-028	11S 664803 3928505.2	Ivanpah Lake - Interstate	MDWS	3	1									0.016
NV-029	11S 664779.1 3928538.5	Ivanpah Lake - Interstate	MDWS	3	1									0.012
NV-031	11S 665092.9 3928563.5	Ivanpah Lake - Interstate	RS	3.5	1									0.010
NV-038	11S 665743 3929637.4	Ivanpah Lake - Interstate	MDWS	2.25	2									0.006
NV-039	11S 665852.8 3929727.7	Ivanpah Lake - Interstate	MDWS	2.5	2									0.006
NV-041	11S 666389.7 3930063.8	Ivanpah Lake - Interstate	MDWS	2.5	2									0.011
NV-044	11S 667270.7 3930618.3	Ivanpah Lake - Interstate	JTW	2.5	2									0.006
NV-047	11S 667662.7 3931080.1	Ivanpah Lake - Interstate	JTW	2.25	2									0.005
NV-050	11S 667876.2 3931306.8	Ivanpah Lake - Interstate	JTW	2.25	2									0.007
NV-057	11S 668770.1 3931505.7	Ivanpah Lake - Interstate	JTW	3	0.5									0.011
NV-059	11S 668322.1 3932052.1	Ivanpah Lake - Interstate	JTW	3.5	2									0.011
NV-066	11S 668927.5 3932787.7	Piute wash	JTW	3.5	2									0.008
NV-070	11S 669097 3933177.8	Piute wash	JTW	2.25	3							0.008		0.011
NV-094	11S 670896 3935463.6	Piute wash	JTW	3.25	2									0.008
					Total	0.018	0.010	3.726	0.689	8.950	0.033	0.018	0.034	0.517

[1]Habitat types: Playa = Ivanpah Lake bed; DDS = Desert Saltbush Scrub; JTW = Joshua Tree Woodland; MCBS = Mojave Creosote Brush Scrub; MDWS = Mojave Desert Wash Scrub; Ruderal = Disturbed area devoid of native vegetation

[2] 115 kV tower removal areas

[3] 220 kV pulling, splicing and tensioning areas

4.0 Delineation of CDFG Jurisdictional Habitats

4.1 Regulatory Background

California Fish and Game Code section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, and requires any person, state or local governmental agency, or public utility to notify the Department of Fish and Game (CDFG) before beginning any activity that will do one or more of the following:

1) substantially obstruct or divert the natural flow of a river, stream, or lake;
2) substantially change the bed, channel, or bank of a river, stream, or lake;
3) use any material from the bed, channel, or bank of a river, stream, or lake; and/or
4) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

This requirement may apply to any work undertaken within the 100-year floodplain of a body of water or its tributaries, including intermittent streams and desert washes (CDFG 1994). In addition, under the Porter-Cologne Water Quality Control Act, a water quality certification from the Regional Water Quality Control Board is required for discharge or fill into any waterway falling under the jurisdiction of CDFG.

4.2 Methods

Field investigations to identify desert washes potentially falling under the regulatory jurisdiction of CDFG were carried out from February 16th through February 27th 2010, concurrently with surveys to identify USACE jurisdictional washes. In California, the maximum extent of all temporary and permanent potential impact areas, including a 50 ft. buffer surrounding all impact areas and access roads, were surveyed on foot. Washes falling within the survey buffer of access roads were mapped only in cases where the washes crossed the road. The overall wash width, width and depth at OHWM (as defined by USACE), habitat type, and up to six of the dominant and/or characteristic plant species and their cover were recorded in the field for each feature. Foliar cover estimates for each dominant or characteristic species were scored on a scale of 1-4 (4= abundant, 3 = common, 2 = scattered, 1 = sparse). A photograph of each mapped feature was taken along with notes on channel characteristics and hydrologic indicators. All drainage features larger than one ft. in width were mapped in the field using a Trimble GeoXT GPS unit with sub-meter accuracy. Features less than about 5 ft. wide were mapped as line features and their acreage extrapolated from the average total wash width recorded in the field. Features greater than about 5 ft. wide were mapped as polygons and their acreages calculated directly.

The location of all riparian trees greater than two inches diameter at breast height (dbh) were marked with a GPS unit in the field.

4.3 Results

Description of Jurisdictional Features

In California, all desert wash channels were mapped, including many washes that appear to carry flows only during extreme storm events, and therefore do not support vegetation typical of channels that conduct flows more frequently. Although such channels are not considered to be jurisdictional by USACE (2001, 2008b), CDFG may assert jurisdiction over these features (CDFG 1994). The following habitat types were observed within potentially CDFG-jurisdictional areas that lie within the maximum limit of potential project disturbance: the playa surface of Ivanpah Lake, Desert Saltbush Scrub, Mojave Creosote Brush Scrub, Mojave Desert Wash Scrub, and a ruderal area devoid of native vegetation.

The playa surface of Ivanpah Lake is composed of lacustrine deposits that are very poorly drained, ponding occurs following sufficient rain events, and the lake bed is devoid of vegetation. The habitat of one wash within California was characterized as ruderal and was vegetated exclusively by the invasive exotic species Russian thistle. The species composition of the remaining wash habitats occurring within the California portion of the project area is summarized in Table 3.

4.3.1 Summary of Potentially Jurisdictional Areas

In California, the proposed project will potentially result in up to a total of approximately 15.524 acres of temporary impacts and up to approximately 0.333 acres of permanent impacts to playa and desert wash habitats that are presumed to fall under the jurisdiction of CDFG. The total acreage within the maximum limits of potential temporary and permanent impacts to potential CDFG jurisdictional habitats categorized by habitat type and type of construction impact is summarized in Table 4. Maps depicting the potential CDFG jurisdictional habitats that may be permanently or temporarily impacted within the maximum limits of project construction or occurring within a 50 ft survey buffer surrounding all project construction sites, laydown areas and access roads, are presented in Appendix D.

The application for a stream alteration agreement under section 1602 of the Fish and Game Code requires reporting the number of all trees greater than four inches in diameter at breast height (DBH). The only tree species occurring within the areas subject to potential project impacts is catclaw acacia. Six catclaw acacia trees greater than four inches DBH occur within potential temporary impact areas and four catclaw acacia trees occur within potential permanent impact areas. The locations of the potentially impacted trees and all other catclaw acacias occurring within the 50 ft. survey buffer are depicted in the CDFG maps presented in Appendix D.

Table 3. Species composition of CDFG – jurisdictional wash habitats

Mojave Desert Wash Scrub		Mojave Creosote Brush Scrub		Desert Saltbush Scrub	
Species	**Ave Cov[1]**	**Species**	**Ave Cov[1]**	**Species**	**Ave Cov[1]**
Ambrosia dumosa	3	*Ambrosia dumosa*	3	*Atriplex polycarpa*	3
Hymenoclea salsola	2.5	*Larrea tridentata*	2.5	*Ambrosia dumosa*	1
Achnatherum speciosum	2	*Eriogonum fasciculatum* var. *polifolium*	2	*Larrea tridentata*	1
Encelia virginensis	2	*Achnatherum speciosum*	1.5		
Eriogonum fasciculatum var. *polifolium*	2	*Ephedra* sp.	1.5		
Larrea tridentata	2	*Opuntia echinocarpa*	1.5		
Acacia greggii	1.5	*Pleuraphis rigida*	1.5		
Ephedra sp.	1.5	*Salsola tragus*	1.5		
Krameria erecta	1.5	*Atriplex polycarpa*	1		
Porophyllum gracile	1.5	*Echinocactus polycephalus*	1		
Unknown	1.5	*Ephedra nevadensis*	1		
Baccharis brachyphylla	1	*Eriogonum inflatum*	1		
Echinocereus engelmannii	1	*Erioneuron pulchellum*	1		
Encelia sp.	1	*Hymenoclea salsola*	1		
Ephedra nevadensis	1	*Krameria erecta*	1		
Eriogonum inflatum	1	*Lycium* sp.	1		
Erioneuron pulchellum	1	*Opuntia acanthocarpa*	1		
Lycium andersonii	1	*Opuntia basilaris*	1		
Lycium sp.	1	*Opuntia ramosissima*	1		
Mammillaria tetrancistra	1	*Porophyllum gracile*	1		
Menodora spinescens	1	*Yucca schidigera*	1		
Opuntia acanthocarpa	1	*Salazaria mexicana*	0.5		
Opuntia basilaris	1				
Opuntia echinocarpa	1				
Opuntia ramosissima	1				
Prunus fasciculata	1				
Salazaria mexicana	1				
Sphaeralcea ambigua	1				
Yucca schidigera	1				

Notes:
Not all of the species listed were present in each wash characterized as a particular habitat type.
[1] Average foliar cover when present. Foliar cover was scored on a scale of 1-4 (4= abundant, 3 = common, 2 = scattered, 1 = sparse

Table 4. Summary of impacts to potential CDFG – jurisdictional habitats.

Habitat type[1]	Permanent Impacts (acres)		Temporary Impacts (acres)						Buffer (acres)
	220kV clearance	Microwave tower	115kV tower removal	220 kV P-S-T sites[2]	220kV tower const.	Culvert replacement	Fiber optic underground	Laydown or equip yard	
Playa	0.014		3.714	0.689	8.875				
DSS	0.003		0.040		0.124			0.055	0.496
MCBS	0.054		0.134	0.036	0.176	0.055	0.035	0.048	1.393
MDWS	0.252	0.010	0.801	0.307	0.337		0.095		5.261
Ruderal								0.002	0.000
Totals	0.322	0.010	4.690	1.031	9.513	0.055	0.130	0.106	7.151

[1]Habitat types: Playa = Ivanpah Lake bed; DDS = Desert Saltbush Scrub; MCBS = Mojave Creosote Brush Scrub; MDWS = Mojave Desert Wash Scrub; Ruderal = Disturbed area devoid of native vegetation

[2] 220 kV pulling, splicing and tensioning areas

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Appendix A

Plant species observed in the wash habitats of the EITP project site

Scientific Name[1]	Common Name	Indicator Status[3]	
		CA (Reg. 0)	NV (Reg. 8)
Gymnosperms			
Ephedraceae	**Mormon-tea family**		
Ephedra sp.	ephedra		
Ephedra nevadensis	Nevada ephedra		
Pinaceae	**Pine family**		
Pinus monophylla	singleleaf pinyon		
Dicots			
Anacardiaceae	**Sumac family**		
Rhus trilobata	skunkbush sumac	NI	NI
Asteraceae	**Aster family**		
Adenophyllum cooperi	Cooper's dogweed		
Ambrosia dumosa	white bursage		
Ambrosia eriocentra	woolly bur-sage		
Baccharis brachyphylla	shortleaf baccharis		
Bebbia juncea	sweetbush		
Brickellia sp.	brickellbush		
Chrysothamnus paniculatus	Mojave rabbitbrush		
Encelia sp.	brittlebush		
Encelia farinosa	brittlebush		
Encelia frutescens	button brittlebush		
Encelia virginensis	Virgin River brittlebush		
Ericameria laricifolia	turpentine bush		
Gutierrezia sp.	snakeweed		
Hymenoclea salsola	cheesebush		
Malacothrix glabrata	smooth desertdandelion		
Porophyllum gracile	slender poreleaf		
Viguiera parishii	Parish's goldeneye		
Bignoniaceae	**Trumpet-creeper family**		
Chilopsis linearis	desert willow	FACW	FAC
Boraginaceae	**Borage family**		
Cryptantha spp.	cryptantha		
Cactaceae	**Cactus family**		
*Coryphantha** sp.	beehive cactus		
Echinocereus engelmannii	Engelmann's hedgehog cactus		
Ferocactus cylindraceus	California barrel cactus		
Mammillaria tetrancistra	common fishhook cactus		
Opuntia acanthocarpa	buckhorn cholla		
Opuntia basilaris	beavertail pricklypear		

Scientific Name[1]	Common Name	Indicator Status[3]	
		CA (Reg. 0)	NV (Reg. 8)
Opuntia echinocarpa	silver cholla		
*Grusonia parishii**	club cholla		
Opuntia ramosissima	pencil cholla		
Chenopodiaceae	**Goosefoot family**		
Atriplex canescens	fourwing saltbush	FACU	UPL
Atriplex polycarpa	allscale	FACU	FACU
Salsola tragus	prickly Russian thistle		
Fabaceae	**Pea family**		
Acacia greggii	catclaw acacia	FACU	FACU
Psorothamnus fremontii	Fremont's dalea		
Senna armata	spiny senna		
Krameriaceae	**Krameria family**		
Krameria sp.	ratany		
Krameria erecta	littleleaf ratany		
Lamiaceae	**Mint family**		
Salazaria mexicana	bladdersage		
Salvia dorrii	desert sage		
Malvaceae	**Mallow family**		
Sphaeralcea ambigua	desert globemallow		
Oleaceae	**Olive family**		
Menodora spinescens	spiny desert olive		
Polygonaceae	**Buckwheat family**		
Chorizanthe rigida	devil's spineflower		
Eriogonum sp.	buckwheat		
Eriogonum deflexum	flatcrown buckwheat		
Eriogonum fasciculatum var. *polifolium*	California buckwheat		
Eriogonum inflatum	desert trumpet		
Rosaceae	**Rose family**		
Coleogyne ramosissima	blackbrush		
Fallugia paradoxa	Apache plume		
Prunus fasciculata	desert almond		
Scrophulariaceae	**Figwort family**		
Penstemon bicolor	pinto beardtongue		
Solanaceae	**Potato family**		
Lycium sp.	desert-thorn		
Tamaricaceae	**Tamarix family**		
Tamarix sp.	tamarisk		
Zygophyllaceae	**Creosote-bush family**		
Larrea tridentata	creosote bush		

Monocots	
Agavaceae	**Century-plant family**
Yucca baccata	banana yucca
Yucca brevifolia	Joshua tree
Yucca schidigera	Mojave yucca
Poaceae	**Grass family**
Achnatherum sp.	needlegrass
Achnatherum speciosum	desert needlegrass
Aristida sp.	threeawn
Bouteloua sp.	grama
Erioneuron pulchellum	fluff grass
Pleuraphis rigida	galleta grass
Schismus sp.	Mediterranean grass

[1] Names follow Hickman (1993) except where indicated by *.

[3] National List of Plant Species that Occur in Wetlands (Reed 1988).

Plants for which no indicator status is presented are not included on the 1988 list.

FACW = Facultative Wetland Species; Estimated probability of 67% to 99% chance of occurring in wetlands.

FACU = Facultative Upland Species; Estimated probability of 1% to 33% chance of occurring in wetlands.

NI = No Indicator; Insufficient information was available to determine an indicator status.

UPL = Upland Species; Occurs in wetlands in another region, but occurs almost always under natural conditions in nonwetlands in the Regions listed in the table. Estimated <1% probability of occurring in a wetlands

Appendix B.

Representative Photographs of Jurisdictional Features

Photo 1. Desert Saltbush Scrub. USACE-jurisdictional wash NV-016.

Photo 2. Desert Saltbush Scrub. CDFG-jurisdictional wash.

Photo 3. Joshua Tree Woodland. USACE-jurisdictional wash NV-082

Photo 4. Mojave Creosote Brush Scrub. USACE-jurisdictional wash NV-103.

Photo 5. Mojave Desert Wash Scrub. USACE-jurisdictional wash NV-084

Photo 6. Mojave Desert Wash Scrub. CDFG-jurisdictional wash.

Photo 7. Playa at Ivanpah Lake

Photo 8. Rabbitbrush Scrub. USACE-jurisdictional wash NV-031.

Photo 9. Ruderal habitat. USACE-jurisdictional wash NV-165.

Appendix C
Maps of potential USACE – Jurisdictional Waters

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 1 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

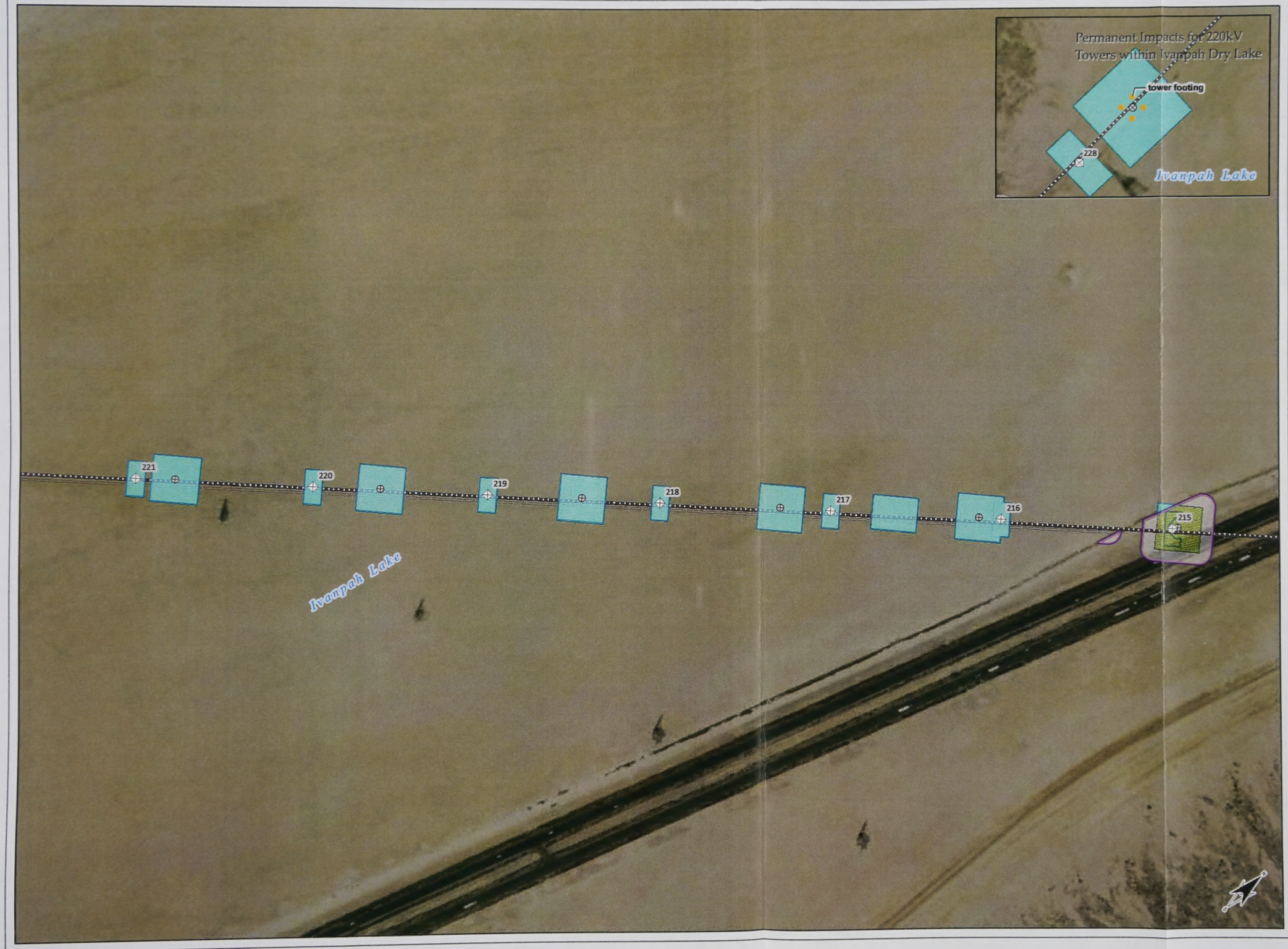
Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 2 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



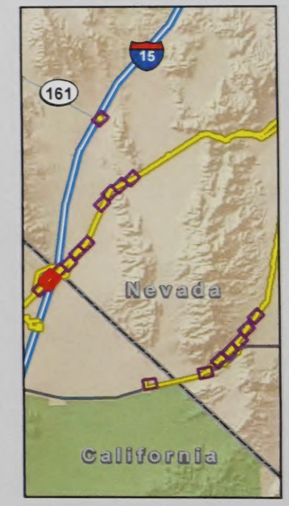
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 3 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

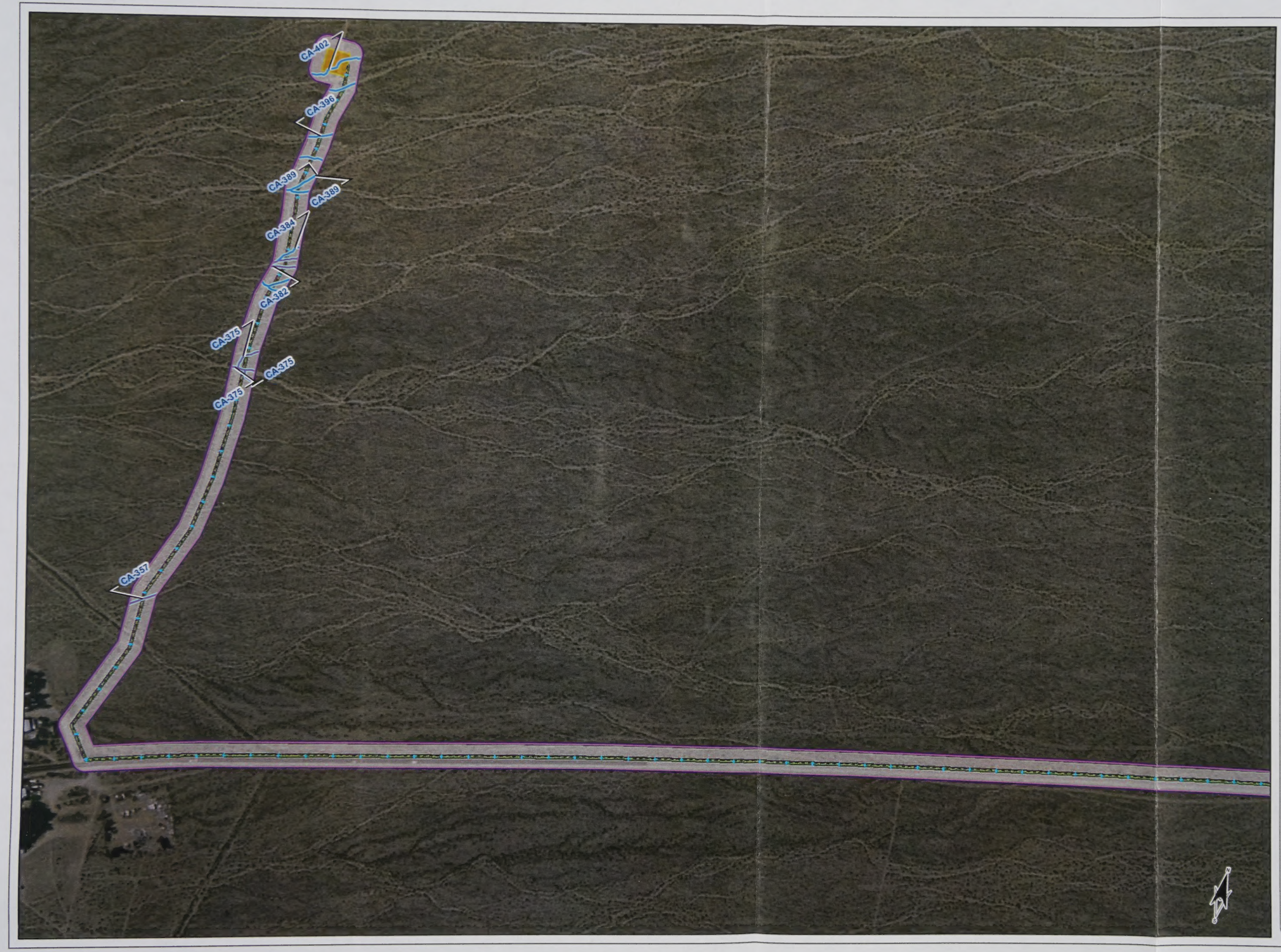
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 4 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 5 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 6 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

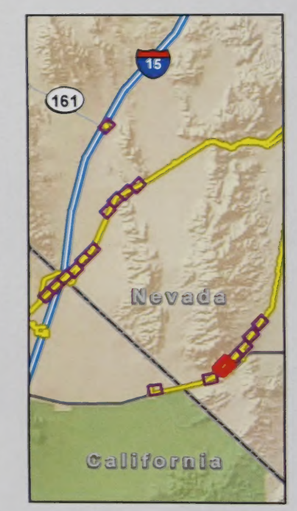
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 7 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

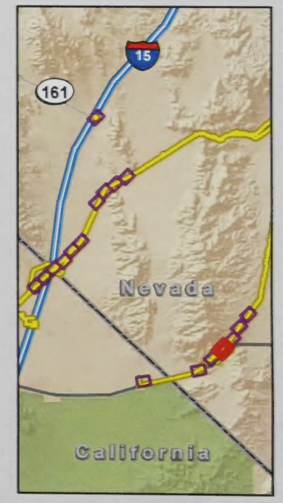
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 8 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

M155-T5
M156-T1
M156-T2
NV-070
NV-059
NV-066
NV-067
NV-070
NV-057

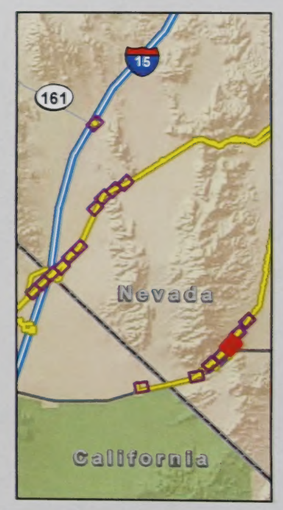
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

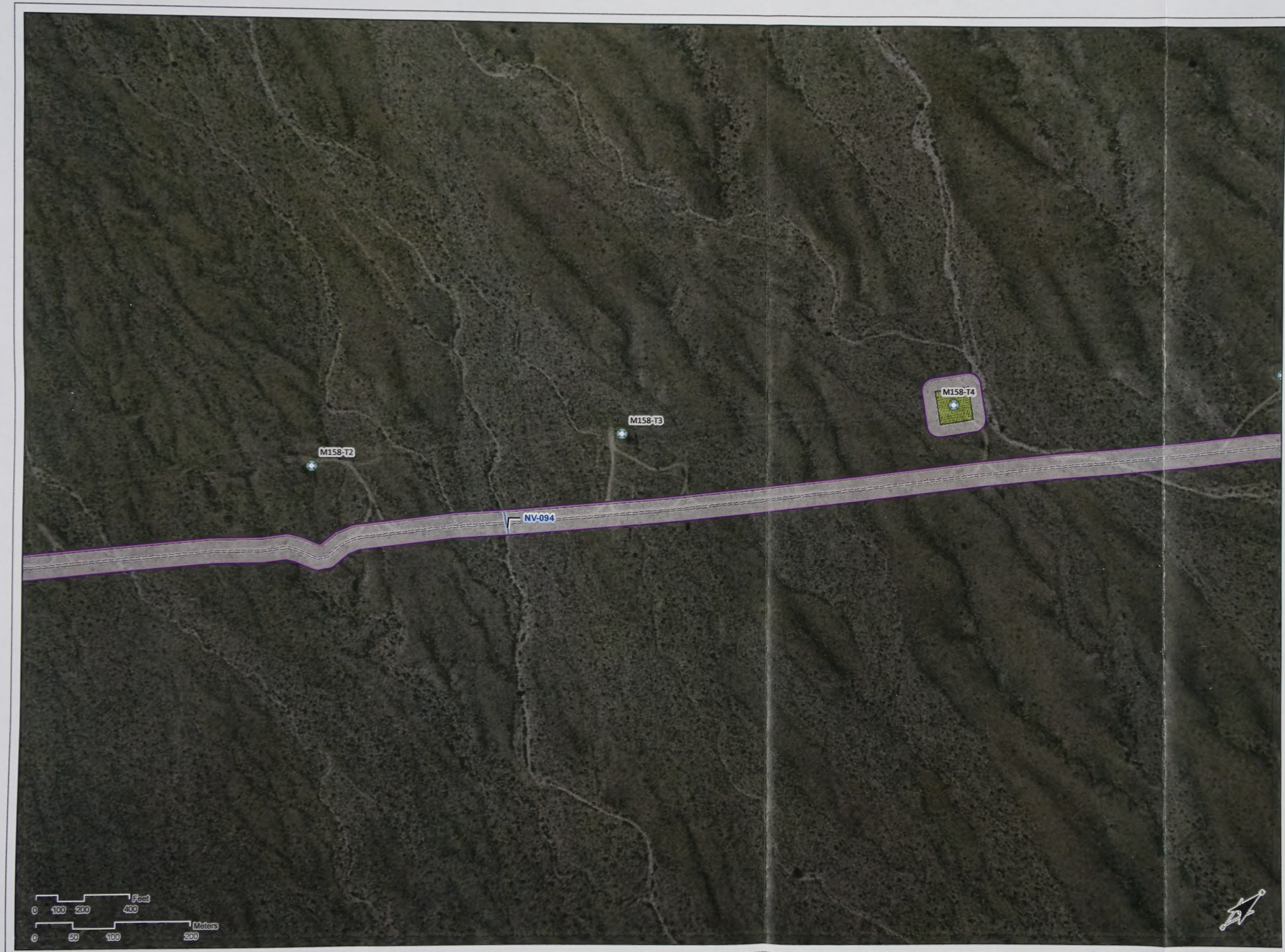
- 50ft survey buffer
- Permanent
- Temporary



Appendix C. Maps of potential USACE- Jurisdictional Waters.

Map 9 of 9

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



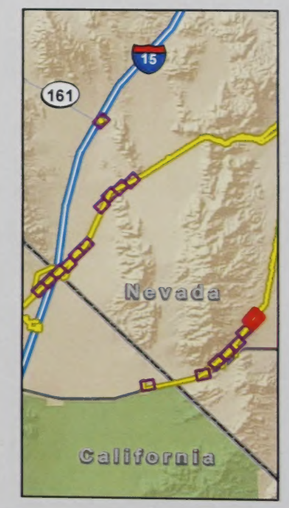
- Pole
- Transmission line
- Telecom
- Access road
- 220 kV tower
- 115 kV tower
- Survey area
- Ivanpah Lake

Wetland Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

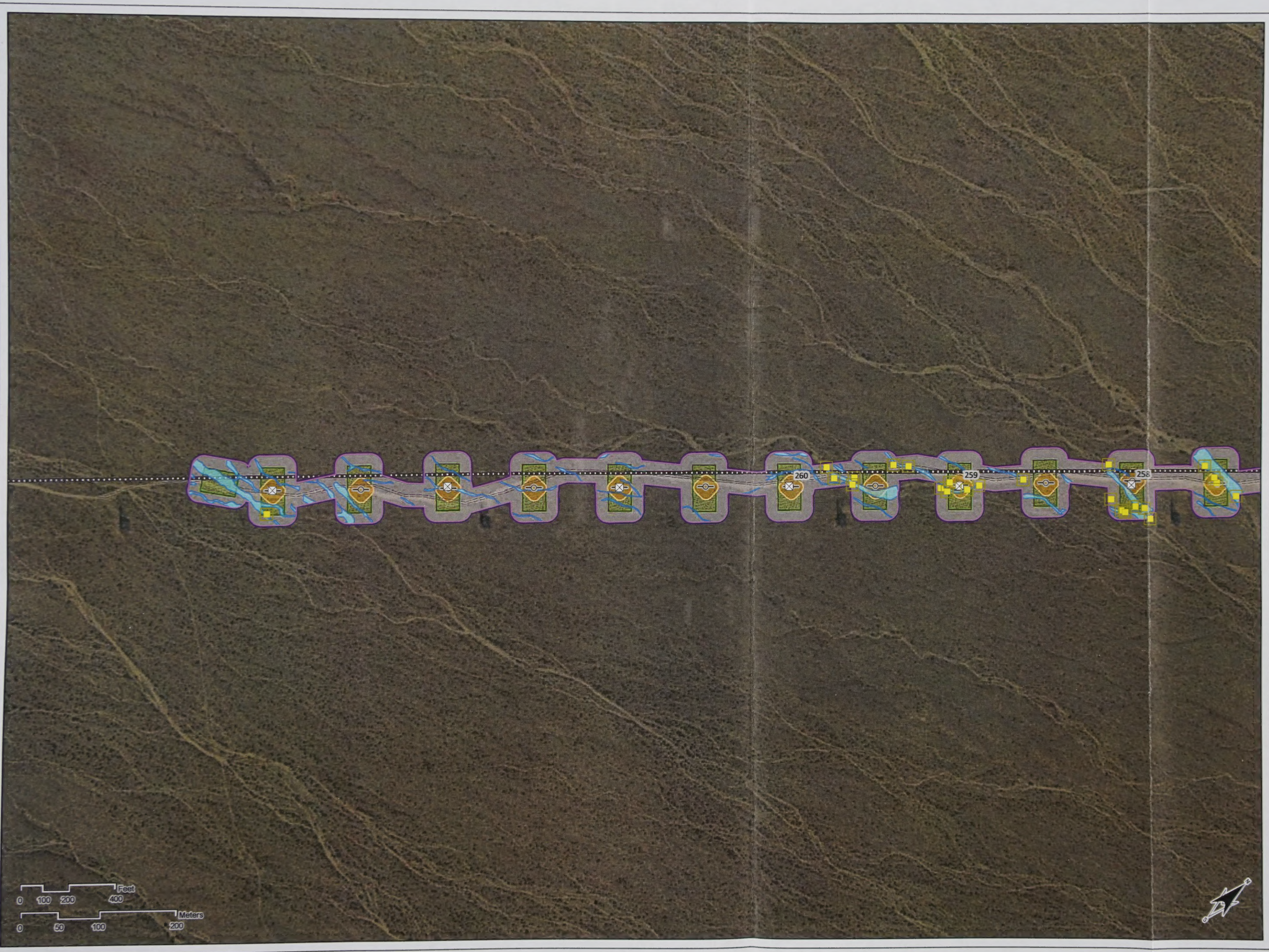


Appendix D
Maps of potential CDFG – Jurisdictional Habitats

Appendix D. Maps of potential CDFG- Jurisdictional Habitats.

Map 1 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



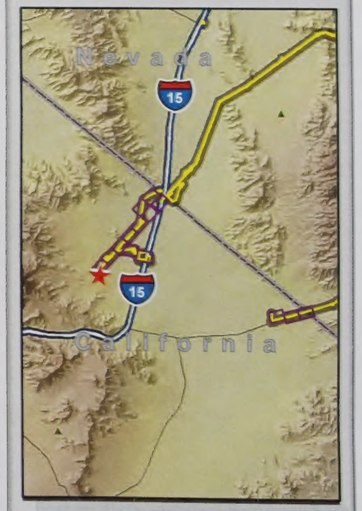
- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- 220 kV tower
- 115 kV tower
- Survey area

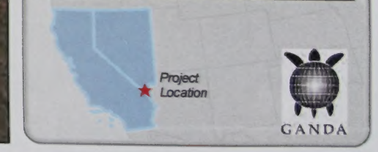
Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary





GANDA

Appendix A

Approved Jurisdictional Determination

U.S. Army Corps of Engineers, Sacramento District

File No.: SPK-2010-00576-SG
Issued: December 16, 2010 (California waters)
March 1, 2010 (Nevada waters)

Eldorado-Ivanpah Transmission Project

Approved Jurisdictional Determination

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

December 16, 2010

Regulatory Division SPK-2010-00576-SG

Curtis Wambach
Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

Dear Mr. Wambach:

We are responding to your March 2010 request for an approved jurisdictional determination for the El Dorado Ivanpah Transmission Line project. The approximately 36.0 linear mile site is located on or near Ivanpah Lake and associated ephemeral drainages, Section 8, Township 27 S, Range 59 E, Mount Diablo Meridian, Latitude 35.712°, Longitude -115.20546°, San Bernardino County, California.

Based on available information, **we concur with the estimate of waters of the United States, as depicted on the March 2010 Figure 3 (Wetlands and Water Feature types) drawing prepared by** Garcia and Associates. Approximately 13.948 acres of waters of the United States, including wetlands, are present within the survey area. These waters are regulated under Section 404 of the Clean Water Act, since Ivanpah Dry Lake is an interstate water as defined under 33 CFR Part 328 – Definitions of Waters of the United States. This Jurisdictional Determination applies only to those drainages associated with Ivanpah Dry Lake. A list of associated drainages is attached. **Other drainages associated with this project are being assessed separately and include Roach Lake, El Dorado Valley and Piute Wash in Nevada.**

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331.

A Notification of Appeal Process and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDS-O, 1455 Market Street, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must

be received at the above address by 60 days from the date of this letter. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2010-00576-SG in any correspondence concerning this project. If you have any questions, please contact Patricia Mcqueary at 321 North Mall Drive, Suite L-101, St. George, Utah 84790, email *Patricia.L.McQueary@usace.army.mil*, or telephone 435-986-3979. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Patricia L. McQueary

Patricia L. McQueary
Chief, St. George Regulatory Office
Sacramento District

Enclosure(s)
JD Form
Maps of project area

Regulatory Action Type	Size	Local Waterway
SPK-2010-0576(IL) (ISOLATE)	13.293	Ivanpah Lake
SPK-2010-0576(CA-357) (ISOLATE)	0.008	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-375) (ISOLATE)	0.02	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-380) (ISOLATE)	0.048	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-382) (ISOLATE)	0.007	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-383) (ISOLATE)	0.008	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-384) (ISOLATE)	0.012	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-389) (ISOLATE)	0.049	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-392) (ISOLATE)	0.011	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-396) (ISOLATE)	0.013	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-400) (ISOLATE)	0.014	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-402) (ISOLATE)	0.022	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-455) (ISOLATE)	0.219	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(CA-457) (ISOLATE)	0.004	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-001) (ISOLATE)	0.009	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-002) (ISOLATE)	0.037	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-011) (ISOLATE)	0.015	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-013) (ISOLATE)	0.051	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-014) (ISOLATE)	0.007	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-28) (ISOLATE)	0.016	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-029) (ISOLATE)	0.012	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-31) (ISOLATE)	0.01	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-38) (ISOLATE)	0.006	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-39) (ISOLATE)	0.006	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-41) (ISOLATE)	0.011	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-44) (ISOLATE)	0.006	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-47) (ISOLATE)	0.005	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-50) (ISOLATE)	0.007	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-57) (ISOLATE)	0.011	Unnamed Tributary of Ivanpah Lake
SPK-2010-0576(NV-59) (ISOLATE)	0.011	Unnamed Tributary of Ivanpah Lake
Total acreage	13.948	

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

March 1, 2011

Regulatory Division SPK-2010-00576-SG

Curtis Wambach
Southern California Edison
2244 Walnut Grove Avenue
Rosemead, California 91770

Dear Mr. Wambach:

We are responding to your August 18, 2010 request for an approved jurisdictional determination for the El Dorado Ivanpah Transmission Line project. The approximately 36.0 linear mile site is located on or near Roach Lake and associated ephemeral drainages, Township 25 S and Range 60 E and Township 26 S, Range 59 E, Mount Diablo Meridian, Latitude 35.67°, Longitude -115.323°, Clark County, Nevada.

Based on available information, **we have determined that drainages NV 066, NV 70 and NV94 are waters of the United States, as depicted on the Figure 3: Wetland and water features (Maps 16 and 17) in Appendix B-5 of the Delineation report prepared by Garcia and Associates (March 2010).** Approximately 0.047 acres of waters of the United States, including wetlands, are present within the survey area. These waters are regulated under Section 404 of the Clean Water Act, since they are have a significant nexus to Piute Wash, an interstate water that is a tributary of the Colorado River.

Drainages listed in the table below have been determined to be intrastate isolated water with no apparent interstate or foreign commerce connection. As such, these waters are not currently regulated by the Corps of Engineers. This disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act. Other Federal, State, and local laws may apply to your activities. *In particular, you may need authorization from the U.S. Fish and Wildlife Service.*

Regulatory Action Type	Size	Local Waterway
SPK-2010-0576(NV-67) (ISOLATE)	0.006	Unnamed Tributary of Piute Wash
SPK-2010-0576(NV-74) (ISOLATE)	0.006	Unnamed Tributary of Piute Wash
SPK-2010-0576(NV-78) (ISOLATE)	0.007	Unnamed Tributary of Piute Wash
SPK-2010-0576(NV-82) (ISOLATE)	0.023	Unnamed Tributary of Piute Wash
SPK-2010-0576(NV-87) (ISOLATE)	0.01	Unnamed Tributary of Piute Wash
SPK-2010-0576(NV-91) (ISOLATE)	0.013	Unnamed Tributary of Piute Wash
SPK-2010-0576(NV-106) (ISOLATE)	0.014	Unnamed Tributary of Piute Wash
Total	0.079	

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331.

A Notification of Appeal Process and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDS-O, 1455 Market Street, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 60 days from the date of this letter. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey (http://per2.nwp.usace.army.mil/survey.html)*.

Please refer to identification number SPK-2010-00576-SG in any correspondence concerning this project. If you have any questions, please contact Patricia Mcqueary at 321 North Mall Drive, Suite L-101, St. George, Utah 84790, email *Patricia.L.McQueary@usace.army.mil*, or telephone 435-986-3979. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Patricia L. McQueary

Patricia L. McQueary
Chief, St. George Regulatory Office
Sacramento District

Enclosure(s): Map of Project area

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Curtis Wambach Southern California Edison 2244 Walnut Grove Avenue Rosemead, California 91770	File No.: SPK-2010-00576-SG	Date: March 1, 2011

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/inet/functions/cw/cecwo/reg* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
Patricia Mcqueary
Regulatory Project Manager
U.S. Army Corps of Engineers
321 N Mall Drive, Suite L-101, St. George, Utah
Phone: 435-986-3979, FAX 435-986-3981
Email: Patricia.L.McQueary@usace.army.mil
(Use this address for submittals to the **district** engineer)

If you only have questions regarding the appeal process you may also contact:
Thomas J. Cavanaugh
Administrative Appeal Review Officer
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, California 94103-1399
Phone: 415-503-6574, FAX 415-503-6646)
Email: Thomas.J.Cavanaugh@usace.army.mil
(Use this address for submittals to the **division** engineer)

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
Signature of appellant or agent.		

Figure 1. Project location.

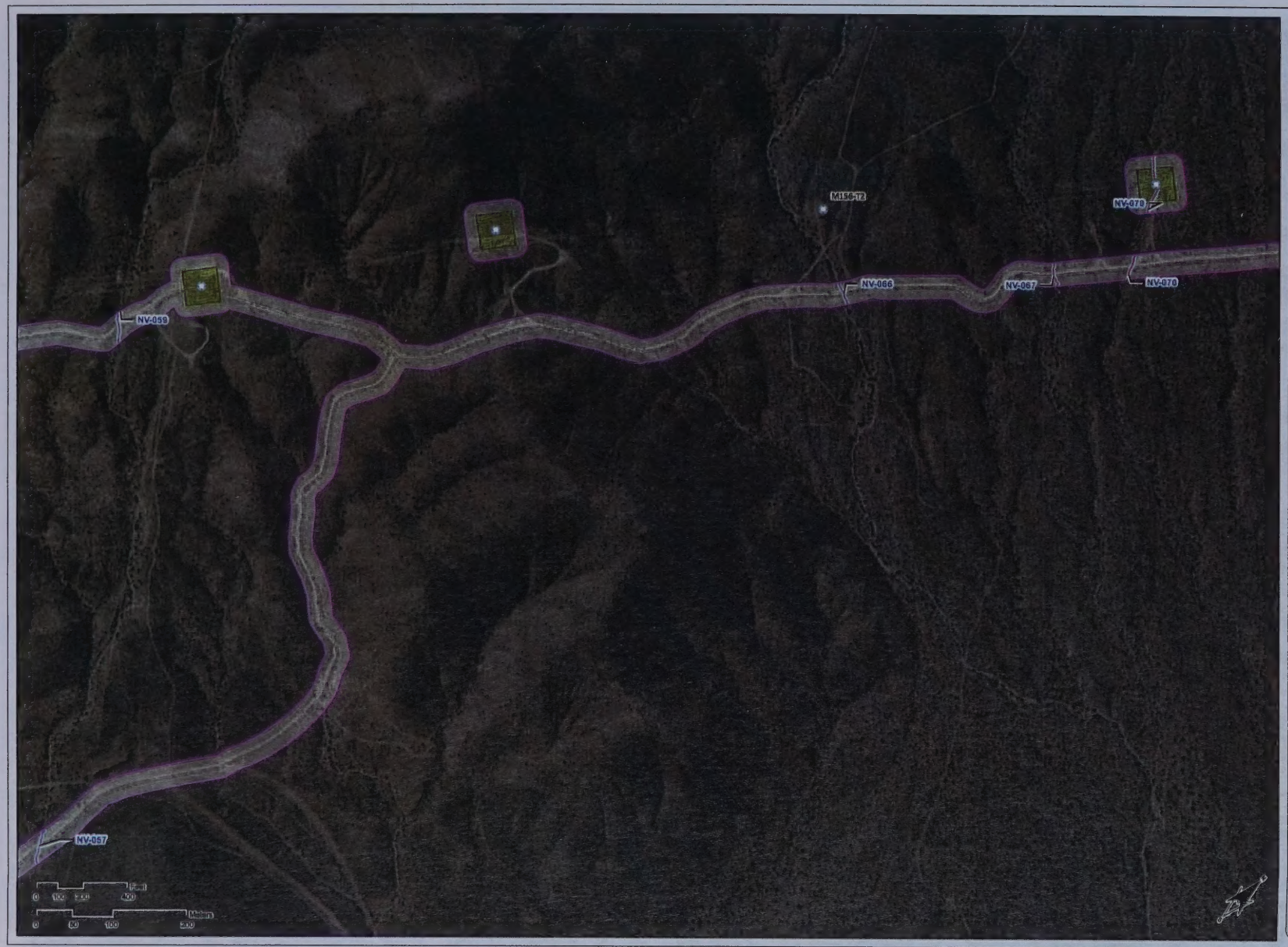


Figure 3. Wetland and water feature types. Map 16 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

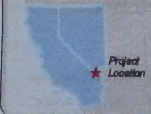
- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



BRANDA

Figure 3. Wetland and water feature types. Map 17 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
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- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width In Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

Figure 3. Wetland and water feature types. Map 18 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
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Work Area Impact Type

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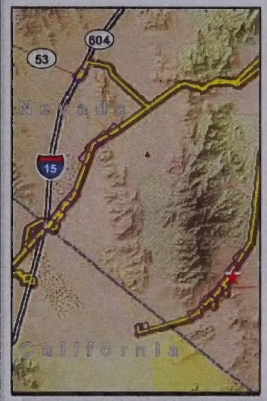
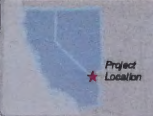
- Permanent
- Temporary

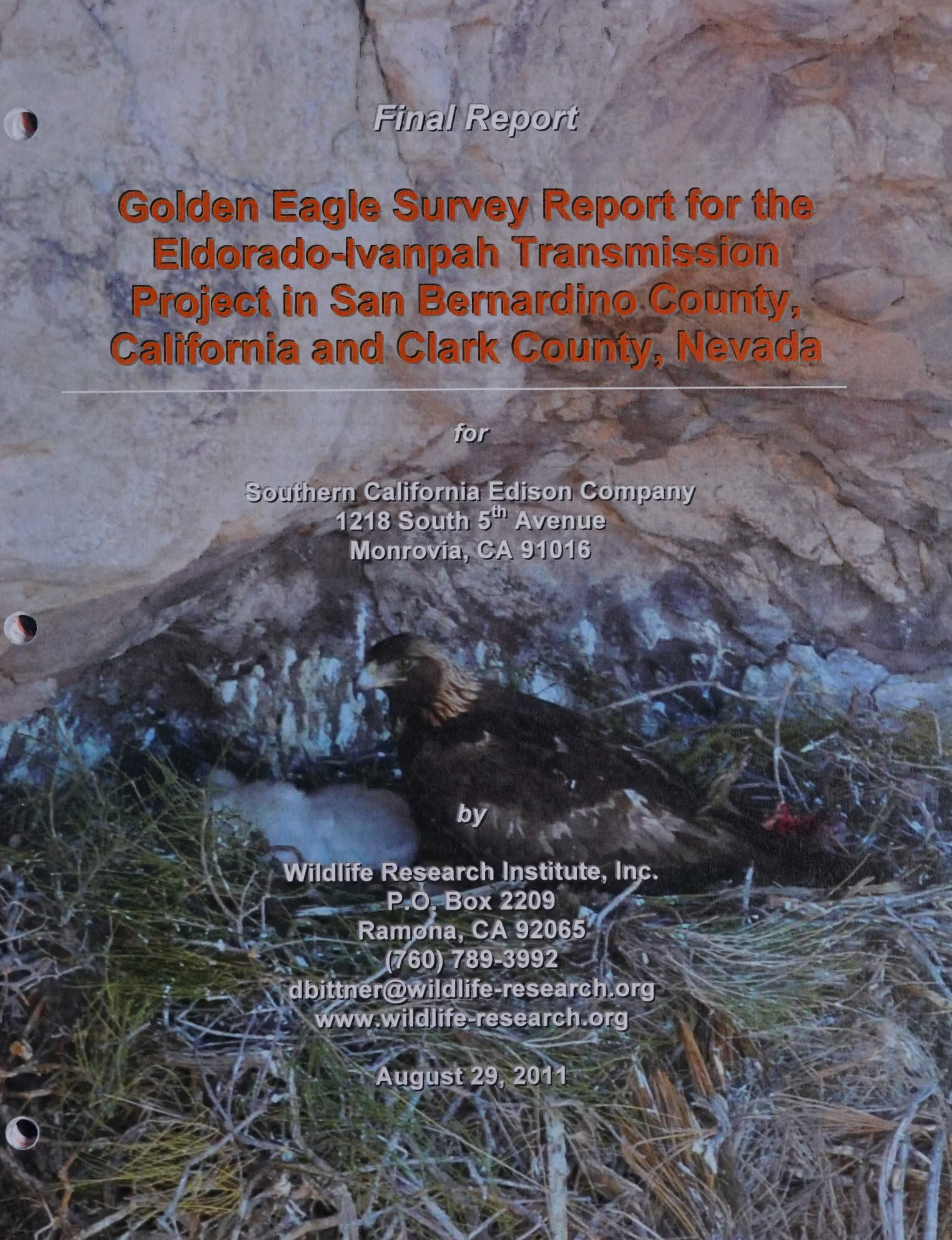




CANDA

Eldorado-Ivanpah Transmission Project

Golden Eagle Survey



Final Report

Golden Eagle Survey Report for the Eldorado-Ivanpah Transmission Project in San Bernardino County, California and Clark County, Nevada

for

Southern California Edison Company
1218 South 5th Avenue
Monrovia, CA 91016

by

Wildlife Research Institute, Inc.
P.O. Box 2209
Ramona, CA 92065
(760) 789-3992
dbittner@wildlife-research.org
www.wildlife-research.org

August 29, 2011

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Cover Photo// Adult golden eagle with 2 chicks and prey observed in McCullough Mountains at waypoint P94a.

ACKNOWLEDGMENTS

Project Manager: Chris Meador
Senior Wildlife Biologists: Dave Bittner, James Hannan, Ph.D.; Jeff Lincer, Ph.D.
Wildlife Biologists: Chris Meador; Daniel Palmer; Katie Quint; Renée Rivard, Pharm.D.; Brittany Schlotfeldt; Jeff Wells
Field Biologist: James Newland
Data Compilation: Renée Rivard, Pharm.D.; Brittany Schlotfeldt
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SUMMARY

This report provides the findings of both the Phase 1 occupancy and Phase 2 productivity surveys for golden eagles conducted within 4 nautical miles of the Eldorado-Ivanpah Transmission Project (EITP) alignment in order to comply with the U.S. Fish and Wildlife Service recommendations. Surveys for this project were conducted by helicopter to confirm territory activity, occupancy, and productivity. A total of 93 golden eagle nests, comprising 20 territories, were documented during Phase 1 and Phase 2 surveys. Of the 20 golden eagle territories documented, 10 were observed to be active/occupied, 6 of which were productive for the 2011 breeding season (Clark Mountain, Highland Range, Lucy Grey Mountains, McCullough Mountains – North, Sheep Mountain, and Umberci Mine). In total, 20 golden eagle adults and nestlings were observed in addition to 10 other species (i.e., bighorn sheep [*Ovis canadensis*], common raven [*Corvus corax*], great horned owl [*Bubo virginianus*], mule deer [*Odocoileus hemionus*], mountain lion [*Felis concolor*], peregrine falcon [*Falco peregrinus*], prairie falcon [*Falco mexicanas*], red-tailed hawk [*Buteo jamaicensus*], turkey vulture [*Cathartes aura*], and wild burro [*Equus asinus*]) totaling 183 wildlife observations. All sightings have been documented with GPS locations and recorded on the attached maps and tables as recommended in the US Fish and Wildlife Service (USFWS) Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance (Pagel et al. 2010) and the subsequent Draft Eagle Conservation Plan Guidance (Gould and Schmidt 2011).

BACKGROUND ON GOLDEN EAGLES

Golden eagles respond to environmental changes in order to survive; reproduction in golden eagles, as in many predators, is regulated by prey species abundance. Since 1998, Western North America has been in a prolonged drought, interrupted by occasional wet years, and this has affected many species including golden eagles (Bittner et al. 2003). Jackrabbits, an important prey species for golden eagles, have also declined (L. LaPre, Bureau of Land Management [BLM] and M. Jorgenson, California State Parks pers. comm.). Golden eagle adults have persevered but reproductive attempts have dropped to as low as 12% in some regions, such as the Mojave and Sonoran Deserts of the American Southwest (Bittner et al. 2003).

Eagles are large predatory birds with up to 7-foot wingspans; raising young requires a large investment of time and energy. Breeding in Southern California starts in January, nest building and egg laying in February to March, and hatching and raising the young eagles occur from April through June. Once the young eagles are flying on their own, the adult eagles will continue to feed them and teach them to hunt until late November. This huge investment of time and energy on the part of the adults, just to raise one or two young, causes some pairs to take a year off from breeding occasionally even when food is abundant.

After leaving the nest, young eagles will explore their natal area and may continue to hunt close by or may venture tens to hundreds of miles away; occasionally returning briefly to their natal area (Bittner unpublished data).

WRI has learned, based on 23 years of helicopter and ground studies of golden eagles, that an initial helicopter survey can successfully identify approximately 80 to 90% of the golden eagle territories in a given area. Follow-up ground and helicopter surveys have indicated that some nests, and even some pairs, can be missed during the first survey. Second surveys are conducted to determine reproductive success but can also identify successful nesting attempts that were missed during initial surveys as well as reveal fledging success.

GLOSSARY

Nest Terminology

Nest Condition

The nest condition is an important indicator of how recently the nest has been used and whether the nest should be considered "active", which is an indication of territory occupancy.

Photo 1. Example of a nest in good condition decorated with fresh sticks

Good condition - A golden eagle nest in **good condition** has been worked on in the current year or within the past 1 to 3 years; a determination made by observing the age of sticks or recent addition of other materials that make up the nest. Additionally, the presence of a bowl constructed with yucca, with or without new material, is indicative of recent activity and good condition.

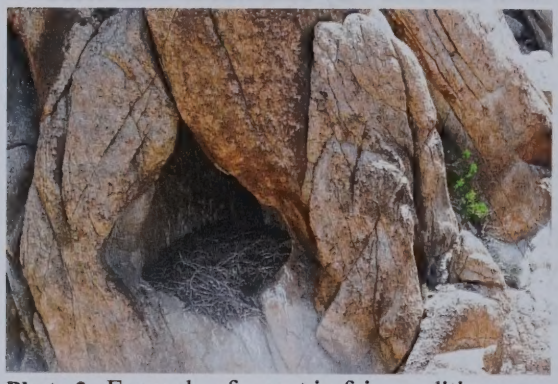


Photo 2. Example of a nest in fair condition

Fair condition – A golden eagle nest in **fair condition** has not been used for several years, shows moderate signs of weathering, and may or may not include a rough bowl.

Photo 3. Example of a nest in poor condition

Poor condition – A golden eagle nest in **poor condition** shows extensive and clear signs of weathering, is in the process of deteriorating, and can often even be decomposing.

Nest Activity

The activity status of a golden eagle nest is an important indicator of how recently the nest has been used and, in the absence of observing an eagle on territory, can provide evidence that a pair of eagles is occupying a territory and preparing for egg laying.

Photo 4. Example of an active nest with new material in bowl

Photo 5. Example of an occupied nest with an incubating female golden eagle

Photo 6. Example of an inactive nest that is deteriorating

Active nest (occupancy implied) - An **active golden eagle nest** is a nest in good condition that has been decorated (new material added to the nest) during the current breeding season. It will usually include the use of yucca, new sticks, fresh greenery and the construction of a bowl, which is created in preparation for egg-laying and incubation. An active nest may not necessarily be **occupied** but does constitute evidence of, and thereby implies, territory occupancy.

Occupied nest (occupancy confirmed) – An **occupied golden eagle nest** is an active nest used for breeding in the current year by a pair in which an adult or young golden eagle, or a new egg, has been observed. A nest is considered by the USFWS to be "occupied" throughout the periods of egg laying, incubation, brooding, fledging, and post-fledging dependency of the young.

Once a nest is chosen for incubation, other nests previously observed in the territory to be active no longer need to be monitored.

Inactive nest - An **inactive golden eagle nest** is a nest that is not currently being used by eagles as determined by the continued absence of any nest decoration, adult, egg, or dependent young during the current breeding season. An inactive nest may become active again in subsequent breeding seasons and remains protected under the Eagle Act.

Nest Arrangement

A golden eagle pair may often construct several nests in close proximity to one another. Often times, these nests are within a few feet of each other and may lie in a vertical or horizontal arrangement.

Photo 7. Example of multiple (2) nests in close proximity marked by a single waypoint

Marking multiple nests at one waypoint – During surveys, multiple nests in close proximity to one another are often recorded at a single waypoint for graphic clarity and readability.

WRI uses the following format for denoting multiple nests, for example 2, at one waypoint: A01GE2SN, where A is a unique trip identifier, 01 is the waypoint number, GE is the species of the nest builder, 2 is the number of nests at the waypoint, and SN is the type of nest such as "stick nest."

Territory Terminology

A golden eagle nesting territory is a confined locality that contains, or historically contained, one or more nests within the home range of a mated pair (Pagel et al. 2010). According to the USFWS Interim Golden Eagle Guidance, all nest sites within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing affinity to a given area (Pagel et al. 2010).

Active/Occupied territory

A golden eagle territory may be determined to be "active" (or more specifically "occupied") for the current breeding season if either of the following observations is made: (1) one or both of a golden eagle pair is explicitly observed demonstrating pair bonding activity, such as nest building or courtship behavior (active with confirmed occupancy) or (2) if *evidence* of pair bonding activities is observed, such as observing a decorated nest, (active with implied occupancy).

Inactive territory

A golden eagle territory is determined to be inactive if occupancy or breeding cannot be confirmed. This occurs if no golden eagle pair bonding or evidence of pair bonding is observed for the current breeding season during the surveys. Golden eagles sometimes take a year or two off from breeding and may still be living in the territory even in the absence of breeding. Inactive territories may become active again.

INTRODUCTION

WRI conducted aerial surveys for golden eagles within a 4-nautical mile spatial boundary of the Southern California Edison (SCE) project alignment to record and report occupancy (Phase 1) and productivity (Phase 2) of resident golden eagles in order to comply with the U.S. Fish and Wildlife Service recommendations (Pagel et al. 2010; Gould and Schmidt 2011).

PROJECT DESCRIPTION

Southern California Edison (SCE) intends to construct the Eldorado-Ivanpah Transmission Project (EITP or "project") to increase electric power transmission capacity to accommodate solar generation facilities anticipated to be developed in the Ivanpah Valley area near the California-Nevada border. The EITP will replace approximately 35 miles of existing single-circuit 115-kV subtransmission line with a double-circuit 220-kV transmission line that will follow the existing SCE right-of way (ROW) from the planned Ivanpah Substation, located west of Ivanpah Dry Lake, to the existing Eldorado Substation, located on the east side of the McCullough Range. The EITP is located in Clark County, Nevada and San Bernardino County, California near Primm, Nevada (Figure 1, Vicinity Map).

The EITP project entails removing and replacing a 35-mile section of the existing Eldorado-Baker-Coolwater-Dunn Siding Mountain Pass 115-kV transmission line with the new Eldorado-Ivanpah 220-kV double-circuit transmission line. The project will also construct the new Ivanpah Substation, install upgrades at the existing Eldorado Substation, and install telecommunications line along with the new transmission line as well as a second redundant telecommunications link between the Ivanpah and Eldorado substations. The redundant telecommunication linkage will consist of an optical ground wire (OPGW) first strung along the existing 500-kV Eldorado-Lugo transmission line for approximately 25 miles between the Eldorado Substation and Nipton Road, then would be installed underground for approximately 5 miles along the northern edge of Nipton Road, thence connecting to a new microwave tower a short distance north of Nipton, California. The final element of the telecommunication linkage would involve microwave signals transmitted between the new tower near Nipton and another new tower constructed eight miles away at the Ivanpah Substation.

Site preparations and construction and demolition efforts would be accomplished using different types of equipment and vehicles to perform multiple project efforts such as road clearing and grading, dismantling and removal of existing facilities, moving equipment and material, and installing project components. Equipment to be used would include small vehicles, such as pick-up trucks, up to large semi-trucks for hauling equipment, material, and personnel, specialized trucks for specific work elements such as drill rigs, concrete mixers, pumping trucks, bucket trucks, as well as a boom crane, rough terrain crane, and truck cranes and other support trucks for moving and erecting the towers and substation equipment. Helicopters will be used in areas where access is limited or impractical for particular activities and for transmission line stringing operations. Tensioning, pulling, and splicing equipment will be used for wire stringing operations.

PROJECT LOCATION

General alignment of EITP area. The golden eagle surveys for this project covered an approximate 4-nautical mile spatial buffer along the outer boundary of the project linear footprint.

Figure 1. Project Location Map.

SURVEY AREA

The EITP alignment is approximately 59.65 miles long, traversing from the SCE microwave site near Nipton, California (CA), in San Bernardino County to the Eldorado Substation in Clark County, Nevada (NV), then through Primm, CA, to the Ivanpah Substation in San Bernardino County, CA and extending further to the Mountain Pass Substation and AT&T site, near Mountain Pass, CA.

The Golden Eagle survey area was 527.5 square miles and encompassed the EITP alignment plus an approximate 4-nautical mile spatial buffer on either side of the linear project footprint. It included areas over BLM, private, and National Park Service land in the McCullough Mountains, Lucy Grey Mountains, and Highland Range in Clark County, NV as well as part of Clark Mountain in San Bernardino County, CA..

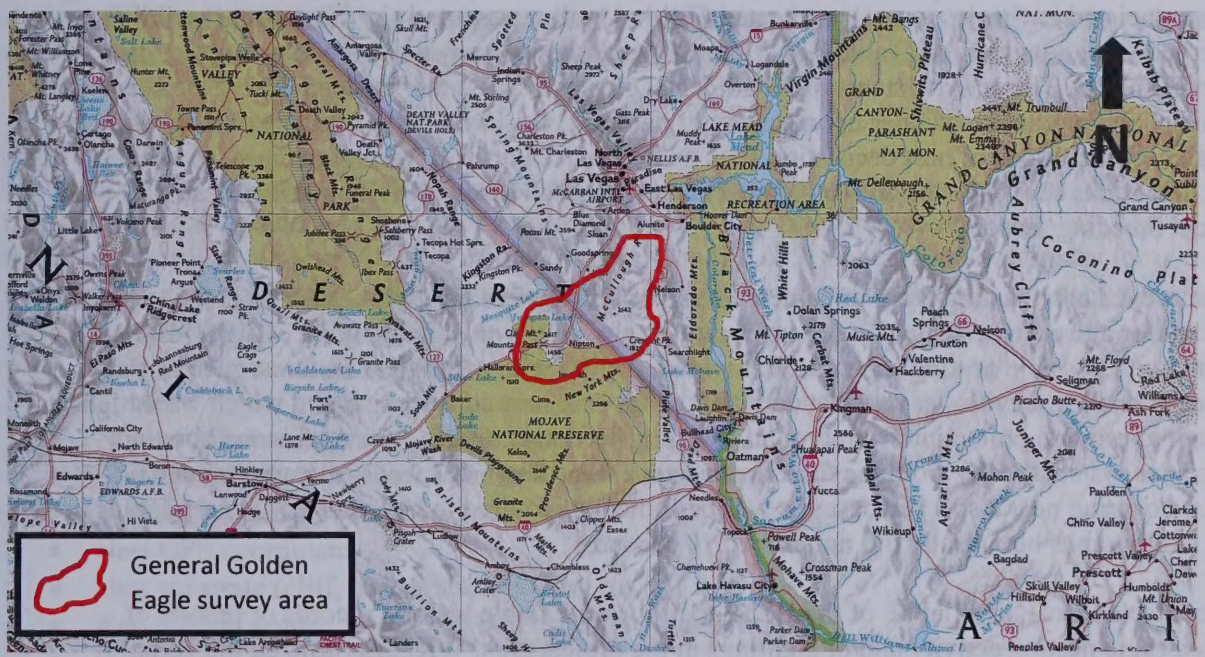


Figure 2. Vicinity Map of EITP alignment.

METHODS AND CONSTRAINTS

All surveying and reporting complies with the current U.S. Fish and Wildlife Service Interim Golden Eagle Inventory and Monitoring Protocols released in 2010 (Pagel et al. 2010) and the subsequent Draft Eagle Conservation Plan (Gould and Schmidt 2011).

Methods

WRI conducted aerial surveys surrounding the proposed project area including an approximate 4-nautical mile spatial buffer measured from the project boundary. It should be noted that spatial distance is measured in nautical miles. Data collected included date, time, weather, species, nest elevation, nest aspect, nest condition, age class of golden eagles observed, and substrate upon which the nest was built. Aerial survey routes were recorded and reported using a GPS system. During the surveys, significant incidental wildlife were recorded and reported including other sensitive species (i.e., peregrine falcons, prairie falcons, bighorn sheep). Golden eagle nests and their associated territories were documented (Table 1); all raptors and significant other wildlife observed were documented (Table 2 and Table 3) and assigned a waypoint on the transect data sheet (Table 4). The activity status of all golden eagle nests was either defined during the survey, if possible, and/or confirmed later upon review of photographs. Even in the absence of incubating females, observations of nest decoration such as fresh yucca or leafy green branches, as well as new nest sticks built into and above old nest material helped assess activity at the nest site for the current breeding season.

We surveyed core nesting areas documented during surveys of this area in 2010 and looked for new and/or alternate nest sites by concentrating on any area with suitable golden eagle nesting habitat with possible nesting substrate that included cliffs with geological features, such as flat ledges or shallow cavities/caves, that could allow for safe nest construction and which were high enough to provide protection from ground-dwelling predators. Cliffs were approached by helicopter systematically from the front and surveys were flown at speeds of approximately 30 knots; hovering near a specific nest site was periodically required to collect specific nest details or take photographs but usually did not exceed 10 seconds.

We contacted Dr. Larry LaPre, of the BLM, to request available historic records or reports of golden eagle nesting activity and/or sightings in the project area. WRI also utilized the verbal information provided by Dr. Larry LaPre to improve our survey focus.

Survey

Initial Phase 1 occupancy surveys were conducted on April 27, 28, and 29; follow up Phase 2 productivity surveys were conducted on May 25, 26, and 27. Aerial surveys were conducted for all territories. Surveys were conducted for the target species, golden eagle. We used a Hughes-500 helicopter for the aerial surveys that provided seating for 3 wildlife biologists (including at least 2 golden eagle biologists) and the pilot. The pilot used by WRI for these surveys also has extensive golden eagle experience (Appendix A).

GPS

Nest site and other location-specific data were determined and documented using hand-held GPS units (Garmin Map60GSx). A sequential number was assigned to each observation that corresponded to the GPS waypoint. Waypoints were recorded using the UTM grid in the WGS 84 Datum. GPS was also used to track our survey routes. Handwritten notes were taken on field forms that documented species, detailed observations, and corresponded to each GPS waypoint (Table 4).

Photography

Photographs were taken with Nikon equipment with GPS units attached so that latitude and longitude could be automatically recorded on each digital picture. Two cameras were used; one for recording wide-angle shots (18-200mm optically-stabilized zoom lens) and another for recording close-ups (200-400mm optically-stabilized zoom lens). The 400mm zoom lens plus the ability to enlarge the digital photographs allows accurate and detailed records to be captured with minimal disturbance to wildlife. This is also important because it allows for review and confirmation of our observations later in an environment that is more stable than the cockpit of a helicopter.

Data

We photographed all active golden eagle nests, some other raptor nests, representations of numerous inactive golden eagle nest sites, and significant other wildlife species observed. The following data were also specifically collected and are on file at WRI but map coordinates for nests of sensitive species (i.e., golden eagle, peregrine falcon, and prairie falcon) may not be included in all reports:

- Species
- Number of nests/alternative nests observed
- Condition of each nest and whether or not it was active
- Nest aspect and elevation
- Nest GPS coordinates
- Nest substrate (cliff, transmission tower, etc.)
- Age class of golden eagles and other species, if determinable
- Behavior of species observed.

It should be noted that red-tailed hawks in particular, as well as other raptors such as prairie falcons, sometimes utilize golden eagle nests for their own nesting, something observed during surveys for this project. During surveys, these nests were attributed to the current occupant (i.e., hawk or falcon), however the original nest builder (i.e., golden eagle) was recorded in the Notes section of the transect data sheet (Table 4). These old golden eagle nests, when viewed along with more current nests, often help define the history and core nesting area/territory of a particular pair of eagles and are, therefore, included in the total count of golden eagle nests for the surveys.

Constraints

March and early April aerial surveys were denied by Nevada state agencies due to concomitant bighorn sheep lambing season. Phase 1 observations were predominantly located in Clark County, NV. Weather restrictions further delayed Phase 1 surveys until the April 27, 2011, start date. Phase 1 aerial surveys of San Bernardino County, CA, were conducted based on the lack of bighorn sheep observations in that portion of the project alignment and 4-nautical mile spatial buffer.

Due to the late Phase 1 start date, Phase 2 surveys were performed 3 days prior to the recommended 30–day time lapse between Phases 1 and 2. The time-sensitive nature of these surveys required that Phase 2 surveys be performed within the biological window of golden eagle fledging, which was sooner than 30 days from the end of Phase 1 completion. Chicks observed in the nest during Phase 1 and not in Phase 2 were very likely to have fledged before Phase 2 surveys could be conducted.

Also, because breeding in Southern California starts in January and this study was initiated in late April, when only those eagle pairs that were successful would be incubating, no opportunity was afforded to view the first phase of reproduction including courtship and other behavioral displays to get a true number of pairs of golden eagles that attempted to reproduce but failed. Therefore, the number of active territorial pairs of golden eagles in the study area could be higher than those actually identified. WRI believes that 80 to 90% of the golden eagle territories were likely identified during the surveys surrounding the EITP alignment.

In that these were diurnal surveys focused on golden eagles, we were less likely to observe nocturnal and crepuscular raptors (i.e., owls) or nocturnal mammals. Aerial surveys also tend to under-represent the smaller species, like the American kestrel (*Falco sparverius*) and burrowing owl (*Athene cunicularia*). No population data can be extrapolated from these surveys except for the focus species, golden eagle.

RESULTS

Map of Golden Eagle Nests Within 4 Nautical Miles of EITP Alignment

Survey results relating specifically to golden eagle sightings, active and productive nests, and inactive nests are depicted on Figures 3A and 3B. Figure 3A depicts the 6 productive golden eagle nests and the 10 non-productive but active golden eagle nests, for which evidence of golden eagle presence was observed, as well as 2 nests where golden eagle activity was apparent but could not be confirmed. Figure 3A also depicts independent sightings of golden eagles both during Phase 1 surveys in late April and the Phase 2 surveys in late May. As may be readily apparent on the figure, some of the independent eagle sightings were in or near active nests.

Figure 3B represents the location of 75 inactive golden eagle nests. No evidence of eagle activity for the 2011 breeding season was observed in association with any of these nests during the surveys. In a few cases other raptor species, including a prairie falcon and red-tailed hawks, were observed to occupy 7 of the inactive golden eagle nests.

Figure 3A & 3B. Golden Eagle Nests Surrounding the EITP Alignment.

Eldorado-Ivanpah Transmission Project

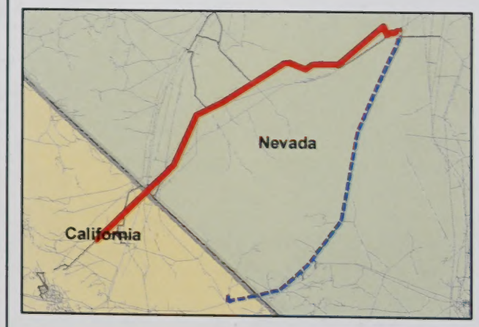
Figure 3A
Golden Eagle Sightings &Active Nests
EITP Alignment Vicinity (Spring 2011)

- Productive Nests (golden eagle chick(s) observed)
- Active but Non-Productive Nests (golden eagle use evident, no chicks
- Possibly Active Nests (golden eagle use apparent, but unconfirmed)
- Golden Eagle Phase 1 Sightings (Late April)
- Golden Eagle Phase 2 Sightings (late May)
- Substations
- Microwave Tower
- AT&T Telecom Facility
- Microwave Signal Path
- Golden Eagle Study Area (8 miles wide centered on the EITP aligment)
- Proposed Transmission Route
- Telecommunication Line Route
- Early Interconnect Telecom Line
- State Boundary

0 1 2 4 Miles

0 0.5 1 2 3 4 5 Kilometers

1:216,000 1 inch = 18,000 feet



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Eldorado-Ivanpah Transmission Project

Figure 3B
Inactive Golden Eagle Nests
EITP Alignment Vicinity (Spring 2011)

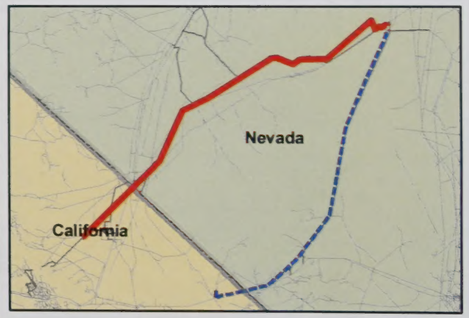
- Inactive Nests (golden eagle use not evident) *
- Substations
- Microwave Tower
- AT&T Telecom Facility
- Microwave Signal Path
- Golden Eagle Study Area (8 miles wide centered on the EITP aligment)
- Proposed Transmission Route
- Telecommunication Line Route
- Early Interconnect Telecom Line
- State Boundary

* Other raptor species were observed using a few of the "Inactive Nests"

0 2 4 Miles

0 2.5 5 Kilometers

1:216,000 1 inch = 18,000 feet



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Survey Flight Paths

The flight paths utilized by WRI during Phase 1 and Phase 2 golden eagle surveys surrounding the EITP alignment are depicted below.

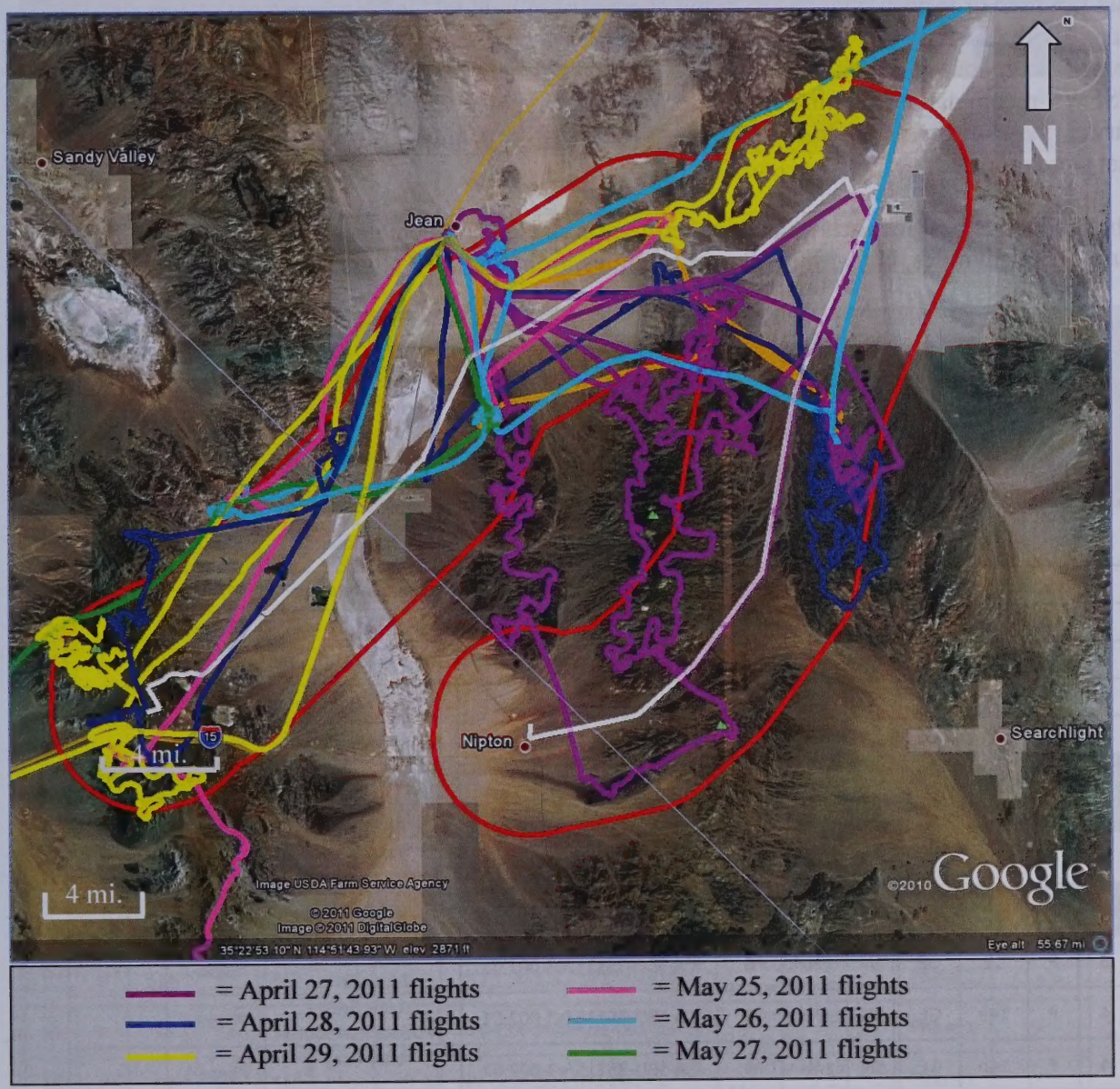

Figure 4. Survey Paths Used for EITP Golden Eagle Surveys.

Golden Eagle Nests and Associated Territories

The table below lists the trip identifier (a unique alpha character applied to each survey conducted during 2011), a waypoint identification number for each golden eagle nest identified, the species that last used or is occupying the nest, the number of individual birds observed at the nest site, the status of nest activity (i.e., active or not during 2011 breeding season), the USGS Quad territory name (incorporating the state, county, and US Geological Survey [USGS] Quad; which is the USFWS-recommended naming convention), the geographical area where the nest was located, the survey phase during which the nest was observed, and the original waypoint of the nest for nests that were revisited.

The productive nest for each productive territory is shaded in green; nests that were located further than 4 nautical miles, but within 5.8 nautical miles, from the EITP alignment are shaded in grey.

Territory #	Trip ID	Waypoint #	Species	Nest Type	GE Nest Active in 2011 (Yes/No/Possibly)	# of GE Young Produced	USGS Quad Territory Name	Geographical Area	Survey Phase	Original Waypoint
1	P	3	PR (GE)	SN	N	0	NV-CLK-3511/g3-001-01	Sheep Mountain	Phase 1	-
1	P	5	GE	SN	Y	0	NV-CLK-3511/g3-001-02	Sheep Mountain	Phase 1	-
1	V	20	GE	SN	Y	0	NV-CLK-3511/g3-001-02	Sheep Mountain	Phase 2	P5
1	P	6	GE	SN	Y	0	NV-CLK-3511/g3-001-03	Sheep Mountain	Phase 1	-
1	P	7	GE	SN	N	0	NV-CLK-3511/g3-001-04	Sheep Mountain	Phase 1	-
1	P	8	GE	SN	N	0	NV-CLK-3511/g3-001-05	Sheep Mountain	Phase 1	-
1	V	19	GE	SN	Y	2	NV-CLK-3511/g3-001-06	Sheep Mountain	Phase 2	New Phase 2 Nest
2	P	10	GE	SN	Y	2	NV-CLK-35115/f3-001-01	Lucy Grey Mountains - North	Phase 1	-
2	V	17	GE	SN	Y	2	NV-CLK-35115/f3-001-01	Lucy Grey Mountains - North	Phase 2	P10
3	P	12	GE	SN	N	0	CA-SBD-35115/e3-001-01	Lucy Grey Mountains	Phase 1	-
4	P	14a	GE	SN	N	0	CA-SBD-35115/e3-002-01	Lucy Grey Mountains - South	Phase 1	-
4	P	14b	GE	SN	N	0	CA-SBD-35115/e3-002-02	Lucy Grey Mountains - South	Phase 1	-
5	P	17	GE	SN	N	0	CA-SBD-35115/d2-001-01	Crescent Peak	Phase 1	-
6	P	20	GE	SN	Y	0	NV-CLK-35115/e2-001-01	McCullough Mountain - South	Phase 1	-
6	P	63	RT (GE)	SN	N	0	NV-CLK-35115/e2-001-02	McCullough Mountain - South	Phase 1	-
7	P	22a	GE	SN	N	0	NV-CLK-35115/f2-001-01	McCullough Pass	Phase 1	-
7	P	24	GE	SN	N	0	NV-CLK-35115/f2-001-02	McCullough Pass	Phase 1	-
7	P	25	GE	SN	N	0	NV-CLK-35115/f2-001-03	McCullough Pass	Phase 1	-
7	P	44	(RT) GE	SN	N	0	NV-CLK-35115/f2-001-04	McCullough Pass	Phase 1	-

Territory #	Trip ID	Waypoint #	Species	Nest Type	GE Nest Active in 2011 (Yes/No/Possibly)	# of GE Young Produced	USGS Quad Territory Name	Geographical Area	Survey Phase	Original Waypoint
7	P	45	GE	SN	N	0	NV-CLK-35115/f2-001-05	McCullough Pass	Phase 1	-
7	P	46	GE	SN	N	0	NV-CLK-35115/f2-001-06	McCullough Pass	Phase 1	-
8	P	28a	GE	SN	N	0	NV-CLK-35115/f2-002-01	McCullough Pass - North	Phase 1	-
8	P	28b	RT (GE)	SN	N	0	NV-CLK-35115/f2-002-02	McCullough Pass - North	Phase 1	-
8	P	29	GE	SN	N	0	NV-CLK-35115/f2-002-03	McCullough Pass - North	Phase 1	-
8	P	35	GE	SN	N	0	NV-CLK-35115/f2-002-04	McCullough Pass - North	Phase 1	-
8	P	36	GE	SN	N	0	NV-CLK-35115/f2-002-05	McCullough Pass - North	Phase 1	-
8	P	37	GE	SN	N	0	NV-CLK-35115/f2-002-06	McCullough Pass - North	Phase 1	-
8	P	39	GE	SN	N	0	NV-CLK-35115/f2-002-07	McCullough Pass - North	Phase 1	-
8	P	40	GE	SN	N	0	NV-CLK-35115/f2-002-08	McCullough Pass - North	Phase 1	-
8	P	43	GE	SN	N	0	NV-CLK-35115/f2-002-09	McCullough Pass - North	Phase 1	-
9	P	33b	GE	SN	Y	0	NV-CLK-35115/f2-003-01	McCullough Mountains	Phase 1	-
9	P	34	GE	SN	N	0	NV-CLK-35115/f2-003-02	McCullough Mountains	Phase 1	-
9	V	22	GE	SN	Y	0	NV-CLK-35115/f2-003-02	McCullough Mountains	Phase 2	P34
10	P	48	GE	SN	N	0	NV-CLK-35115/f1-001-01	McCullough Mountain - East	Phase 1	-
10	P	50	GE	SN	N	0	NV-CLK-35115/f1-001-02	McCullough Mountain - East	Phase 1	-
10	P	52a	GE	SN	Y	0	NV-CLK-35115/f1-001-03	McCullough Mountain - East	Phase 1	-
10	P	52b	GE	SN	N	0	NV-CLK-35115/f1-001-04	McCullough Mountain - East	Phase 1	-
10	P	58	GE	SN	N	0	NV-CLK-35115/f1-001-05	McCullough Mountain - East	Phase 1	-
10	P	60	GE	SN	N	0	NV-CLK-35115/f1-001-06*	McCullough Mountain - East	Phase 1	-
11	P	90	GE	SN	N	0	NV-CLK-35115/f1-002-01	Highland Range - North	Phase 1	-
11	P	91	GE	SN	N	0	NV-CLK-35115/f1-002-02	Highland Range - North	Phase 1	-
11	P	93	GE	SN	N	0	NV-CLK-35115/f1-002-03	Highland Range - North	Phase 1	-
11	P	94a	GE	SN	Y	2	NV-CLK-35115/f1-002-04	Highland Range - North	Phase 1	-
11	V	18	GE	SN	Y	2	NV-CLK-35115/f1-002-04	Highland Range - North	Phase 2	P94a

Territory #	Trip ID	Waypoint #	Species	Nest Type	GE Nest Active in 2011 (Yes/No/Possibly)	# of GE Young Produced	USGS Quad Territory Name	Geographical Area	Survey Phase	Original Waypoint
11	P	94b	GE	SN	N	0	NV-CLK-35115/f1-002-05	Highland Range - North	Phase 1	
11	P	95	GE	SN	N	0	NV-CLK-35115/f1-002-06	Highland Range - North	Phase 1	-
11	P	96	GE	SN	N	0	NV-CLK-35115/f1-002-07	Highland Range - North	Phase 1	-
11	P	97a	GE	SN	N	0	NV-CLK-35115/f1-002-08	Highland Range - North	Phase 1	-
11	P	97b	GE	SN	N	0	NV-CLK-35115/f1-002-09	Highland Range - North	Phase 1	-
11	P	97c	GE	SN	N	0	NV-CLK-35115/f1-002-10	Highland Range - North	Phase 1	-
11	P	97d	GE	SN	N	0	NV-CLK-35115/f1-002-11	Highland Range - North	Phase 1	-
11	P	97e	GE	SN	N	0	NV-CLK-35115/f1-002-12	Highland Range - North	Phase 1	-
12	P	99	GE	SN	N	0	NV-CLK-35115/f1-003-01	Highland Range	Phase 1	-
12	P	100	GE	SN	N	0	NV-CLK-35115/f1-003-02	Highland Range	Phase 1	-
12	P	102	GE	SN	N	0	NV-CLK-35115/f1-003-03	Highland Range	Phase 1	-
12	P	103	GE	SN	N	0	NV-CLK-35115/f1-003-04	Highland Range	Phase 1	-
12	P	104	GE	SN	N	0	NV-CLK-35115/f1-003-05	Highland Range	Phase 1	-
12	P	105	GE	SN	N	0	NV-CLK-35115/f1-003-06	Highland Range	Phase 1	-
12	P	106	GE	SN	N	0	NV-CLK-35115/f1-003-07	Highland Range	Phase 1	-
12	P	107	GE	SN	N	0	NV-CLK-35115/f1-003-08	Highland Range	Phase 1	-
12	P	115	RT (GE)	SN	N	0	NV-CLK-35115/f1-003-08	Highland Range	Phase 1	-
12	P	121	GE	SN	N	0	NV-CLK-35115/f1-003-09	Highland Range	Phase 1	-
13	P	132	GE	SN	N	0	NV-CLK-35115/e1-001-01	Highland Range - South	Phase 1	-
14	P	154	GE	SN	N	0	NV-CLK-35115/e5-001-01	Clark Mountain - East	Phase 1	-
14	P	155	GE	SN	N	0	NV-CLK-35115/e5-001-02	Clark Mountain - East	Phase 1	-
14	P	156	GE	SN	N	0	NV-CLK-35115/e5-001-03	Clark Mountain - East	Phase 1	-
14	P	173	GE	SN	N	0	NV-CLK-35115/e5-001-04	Clark Mountain – East	Phase 1	-
14	P	174	GE	SN	N	0	NV-CLK-35115/e5-001-05	Clark Mountain - East	Phase 1	-
15	P	159	GE	SN	N	0	CA-SBD-35115/d5-001-01	Mountain Pass	Phase 1	-
15	P	211a	GE	SN	P	0	CA-SBD-35115/d5-001-01	Mountain Pass	Phase 1	-
15	P	211b	GE	SN	P	0	CA-SBD-35115/d5-001-02	Mountain Pass	Phase 1	
15	P	160a	GE	SN	N	0	CA-SBD-35115/d5-001-03	Mountain Pass	Phase 1	-

Territory #	Trip ID	Waypoint #	Species	Nest Type	GE Nest Active in 2011 (Yes/No/Possibly)	# of GE Young Produced	USGS Quad Territory Name	Geographical Area	Survey Phase	Original Waypoint
15	P	160b	GE	SN	N	0	CA-SBD-35115/d5-001-04	Mountain Pass	Phase 1	-
15	P	160c	GE	SN	N	0	CA-SBD-35115/d5-001-05	Mountain Pass	Phase 1	-
15	P	176	GE	SN	N	0	CA-SBD-35115/d5-001-06	Mountain Pass	Phase 1	-
15	P	178	GE	SN	Y	0	CA-SBD-35115/d5-001-07	Mountain Pass	Phase 1	-
15	V	15	GE	SN	Y	0	CA-SBD-35115/d5-001-08	Mountain Pass	Phase 2	P178
16	P	163a	GE	SN	N	0	CA-SBD-35115/e5-002-01	Clark Mountain - South	Phase 1	-
16	P	163b	GE	SN	N	0	CA-SBD-35115/e5-002-02	Clark Mountain - South	Phase 1	-
16	P	164	RT (GE)	SN	N	0	CA-SBD-35115/e5-002-03	Clark Mountain - East	Phase 1	-
16	P	166	GE	SN	N	0	CA-SBD-35115/e5-002-04	Clark Mountain - South	Phase 1	-
17	P	167	GE	SN	N	0	CA-SBD-35115/e5-003-01	Clark Mountain - West	Phase 1	-
17	P	168	GE	SN	Y	2	CA-SBD-35115/e5-003-02	Clark Mountain - West	Phase 1	-
17	V	26	GE	SN	Y	0	CA-SBD-35115/e5-003-02	Clark Mountain - West	Phase 2	P168
17	P	169	GE	SN	N	0	CA-SBD-35115/e5-003-03	Clark Mountain - West	Phase 1	-
17	P	170	GE	SN	N	0	CA-SBD-35115/e5-003-04	Clark Mountain - West	Phase 1	-
18	P	183	GE	SN	N	0	NV-CLK-35115/g1-001-01	McCullough Mountain - Northeast	Phase 1	-
18	P	184a	RT (GE)	SN	N	0	NV-CLK-35115/g1-001-02	McCullough Mountain - Northeast	Phase 1	-
18	P	185	GE	SN	N	0	NV-CLK-35115/g1-001-03	McCullough Mountain - Northeast	Phase 1	-
18	P	186a	GE	SN	N	0	NV-CLK-35115/g1-001-04	McCullough Mountain - Northeast	Phase 1	-
18	P	186b	GE	SN	N	0	NV-CLK-35115/g1-001-05	McCullough Mountain - Northeast	Phase 1	-
18	P	188	GE	SN	N	0	NV-CLK-35115/g1-001-06	McCullough Mountain - Northeast	Phase 1	-
18	P	191	GE	SN	N	0	NV-CLK-35115/g1-001-07	McCullough Mountain - Northeast	Phase 1	-
18	P	193	GE	SN	N	0	NV-CLK-35115/g1-001-08	McCullough Mountain - Northeast	Phase 1	-

Territory #	Trip ID	Waypoint #	Species	Nest Type	GE Nest Active in 2011 (Yes/No/Possibly)	# of GE Young Produced	USGS Quad Territory Name	Geographical Area	Survey Phase	Original Waypoint
19	P	202	GE	SN	N	0	NV-CLK-35115/g2-001-01	McCullough Mountains - North	Phase 1	-
19	P	203	GE	SN	Y	0	NV-CLK-35115/g2-001-02	McCullough Mountains - North	Phase 1	-
19	P	204	GE	SN	Y	0	NV-CLK-35115/g2-001-03	McCullough Mountains - North	Phase 1	-
19	V	24	GE	SN	Y	0	NV-CLK-35115/g2-001-03	McCullough Mountains - North	Phase 2	P204
19	P	205	GE	SN	Y	1	NV-CLK-35115/g2-001-04	McCullough Mountains - North	Phase 1	-
19	V	23	GE	SN	Y	2	NV-CLK-35115/g2-001-04	McCullough Mountains - North	Phase 2	P205
20	V	16	GE	SN	Y	1	CA-SBD-35115/e4-001-01	Umberci Mine	Phase 2	-

CA=California, CLK=Clark County, GE=Golden Eagle, NV=Nevada, SBD=San Bernardino County, SN=Stick Nest.
*Based on the USFWS recommended naming convention, the territory name is based on the county and USGS Quad name of the location of the first nest observed for a given territory. Nests denoted with an asterisk were physically located in a different county or USGS Quad than the first nest, but retain the Quad of origin of the first nest discovered in its USGS Quad territory name.
Golden Eagle nests used by another species during the 2011 breeding season are denoted with occupant species first and the original nest builder, Golden Eagle, in parentheses (GE).

Table 1. Golden Eagle Nests Within 4 Nautical Miles of the EITP Alignment.

Summary of Significant Wildlife Observations

Based on recommendations in the USFWS Interim Golden Eagle Guidelines (Pagel et al. 2010), all significant wildlife observations are documented in Table 1 (Phase 1) and Table 2 (Phase 2) below. All observations are unique unless otherwise noted.

Species	Clark Mountain - East	Clark Mountain - North	Clark Mountain - South	Clark Mountain - West	Eldorado Valley	Highland Range	Ivanpah Valley	Lucy Grey Mountains	McCullough Mountains	Mountain Pass	Plute Valley	Sheep Mountain	Total
Bighorn Sheep						19			10				29
Common Raven		3				2	4	1	11	6			27
Golden Eagle				3		4		2	2		1	2	14
Great Horned Owl			1						3	1			5
Mountain Lion									1				1
Mule Deer	4												4
Peregrine Falcon									1				1
Prairie Falcon						4						6	10
Red-tailed Hawk		3	3		4	22			34	8			74
Turkey Vulture							1		6				7
Wild Burro		2								1			3
Total	**4**	**8**	**4**	**3**	**4**	**51**	**5**	**3**	**68**	**16**	**1**	**8**	**175**

Table 2. Wildlife Observed During Phase 1 Surveys of EITP.

Of the 11 golden eagles (adults and chicks) observed during Phase 2, 6 were unique individuals; 5 were chicks seen initially during Phase 1 surveys and are denoted as such in the table below. In total, 8 unique wildlife observations were documented during Phase 2 surveys.

Species	Clark Mountain - West	Highland Range	Lucy Grey Mountains	McCullough Mountains	Mountain Pass	Sheep Mountain	Umberci Mine	Total
Golden Eagle	0	2*	2*	3†	0	2	2	11
Great Horned Owl	0	0	0	2	0	0	0	2
Total	**0**	**2**	**2**	**5**	**0**	**2**	**2**	**13**

*Same 2 chicks observed during Phase 1.
†Includes 1 chick observed during Phase 1.

Table 3. Wildlife Observed During Phase 2 Surveys of EITP.

All Data for Golden Eagle Surveys of EITP Alignment

Map coordinates (i.e., UTM) of the nests of sensitive species (golden eagles, peregrine falcons, prairie falcons) have been withheld per request of federal agencies in order to protect these species, but are on file at WRI. If needed, this information is available upon request. Golden eagle data are in bold type.

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
(4/27/2011) - 3 flights, flight #1 - [7:31 - 12:43] 55°F, 0% cloud cover, 0-5mph, 0% precip, 10+ mile visibility												
Observers: C. Meador, R. Rivard, J. Lincer												
P	**1**	**GE**		**1**							**adult observed in flight; looks like it has jesses**	**Plute Valley**
P	2	CR	SN	0	11 S 654733 3960162	E		R	N	3426 ft		Sheep Mountain
P	**3**	**PR (GE)**	**SN**	**6**		**E**	**G**	**R**	**Y**	**3412 ft**	**5 young chicks and adult on old GESN**	**Sheep Mountain**
P	**4**	**GE**		**1**						**3671 ft**	**adult observed in flight**	**Sheep Mountain**
P	**5**	**GE**	**SN**	**0**		**SW**	**G**	**R**	**Y**	**3703 ft**	**decorated with yucca**	**Sheep Mountain**
P	**6**	**GE**	**SN**	**0**		**N**	**G**	**R**	**Y**	**3884 ft**	**some new material**	**Sheep Mountain**
P	**7**	**GE**	**SN**	**0**		**SE**	**G**	**R**	**N**	**3499 ft**		**Sheep Mountain**
P	**8**	**GE**	**SN**	**0**		**W**	**F**	**R**	**N**	**3580 ft**		**Sheep Mountain**
P	9	CR		1	11 S 653240 3952757					3564 ft		Lucy Grey Mountains
P	**10**	**GE**	**SN**	**2**		**W**	**G**	**R**	**Y**	**3936 ft**	**2 chicks, ~4 to 5 weeks old**	**Lucy Grey Mountains**
P	11	CR	SN	0	11 S 655628 3943877	N	G	R	N	4590 ft		Lucy Grey Mountains
P	**12**	**RT (GE)**	**SN**	**0**		**S**	**F**	**R**	**N**	**4015 ft**	**old GESN, used by RT**	**Lucy Grey Mountains**
P	13	CR	SN	0	11 S 657972 3935371	W	F	R	N	4370 ft		Lucy Grey Mountains
P	**14a**	**GE**	**SN**	**0**		**S**	**P**	**R**	**N**	**3778 ft**	**on same ledge as 14b**	**Lucy Grey Mountains**
P	**14b**	**GE**	**SN**	**0**		**S**	**P**	**R**	**N**	**3778 ft**		**Lucy Grey Mountains**
P	15	RT	SN	0	11 S 660635 3923694	S	G	R	N	3571 ft		McCullough Mountains
P	16	CR		1	11 S 661090 3923734					3736 ft	observed in flight	McCullough Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	**17**	**GE**	**SN**	**0**		**W**	**F**	**R**	**N**	**3857 ft**		**McCullough Mountains**
P	18	RT	SN	0	11 S 663168 3931339	SE	F	R	N	4721 ft		McCullough Mountains
P	19	RT		1	11 S 663292 3935466					5561 ft	observed in flight	McCullough Mountains
P	**20**	**GE**	**SN**	**0**		**N**	**G**	**R**	**Y**	**5805 ft**		**McCullough Mountains**
P	21	CR		1	11 S 662916 3950126					4335 ft	observed in flight	McCullough Mountains
P	**22a**	**GE**	**SN**	**0**		**N**	**G**	**R**	**N**	**4568 ft**		**McCullough Mountains**
P	22b	U	SN	0	11 S 663979 3950907	N	P	R	N	4568 ft		McCullough Mountains
P	23	BHS		2	11 S 664277 3950623					4887 ft		McCullough Mountains
P	**24**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**5060 ft**		**McCullough Mountains**
P	**25**	**GE**	**SN**	**0**		**W**	**P**	**R**	**N**	**4775 ft**		**McCullough Mountains**
P	26	RT		1	11 S 667316 3951922					4697 ft	immature observed in flight	McCullough Mountains
P	27	RT		1	11 S 667302 3952758					4644 ft	adult observed in flight	McCullough Mountains
P	**28a**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**4302 ft**		**McCullough Mountains**
P	**28b**	**RT (GE)**	**SN**	**1**		**W**	**F**	**R**	**N**	**4302 ft**	**RT incubating on old GESN, egg shell visible**	**McCullough Mountains**
P	**29**	**GE**	**SN**	**0**		**SW**	**F**	**R**	**N**	**4274 ft**		**McCullough Mountains**
P	30	GHO		1	11 S 667997 3956138					3469 ft	observed in flight	McCullough Mountains
P	31	U	SN	0	11 S 668440 3955846	N	G	R	N	3310 ft	looks like GE started and RT finished, nice bowl	McCullough Mountains
Flight #2 - [14:04 - 16:01] 55°F, 0% cloud cover, 0-5mph, 0% precip, 10+ mile visibility												
Observers: J. Lincer, J. Wells, C. Meador												
P	33a	U	SN	0	11 S 668705 3954679	NE	F	R	Y	3539 ft	GE/RT; new yucca	McCullough Mountains
P	**33b**	**GE**	**SN**	**0**	**11 S 668705 3954679**	**NE**	**P**	**R**	**Y**	**3539 ft**	**whitewash from this year**	**McCullough Mountains**
P	33c	PR	CN	0	11 S 668705 3954679	NE		R		3539 ft		McCullough Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	34	GE	SN	0		NW	P	R	N	3467 ft	small nest, big sticks, yucca décor, whitewash from previous 1-2 years.	McCullough Mountains
P	35	GE	SN	0		SE	F	R	N	4048 ft		McCullough Mountains
P	36	GE	SN	0		W	F	R	N	4164 ft		McCullough Mountains
P	37	GE	SN	0		N	P	R	N	4125 ft		McCullough Mountains
P	38	GHO		2	11 S 668358 3952392					4061 ft	adult and juvenile observed in flight	McCullough Mountains
P	39	GE	SN	0		S	P	R	N	4343 ft	smaller bowl built on top of GESN	McCullough Mountains
P	40	GE	SN	0		S	P	R	N	4270 ft		McCullough Mountains
P	41	ML		1	11 S 667709 3950542					4760 ft	full adult without radio collar	McCullough Mountains
P	42	CR	SN	1	11 S 667983 3951025					4285 ft	adult incubating	McCullough Mountains
P	43	GE	SN	0		W	P	R	N	4292 ft		McCullough Mountains
P	44	RT (GE)	SN	4		S	G	R	Y	4687 ft	adult and 3 chicks on old GESN	McCullough Mountains
P	45	GE	SN	0		S	P	R	N	4740 ft		McCullough Mountains
P	46	GE	SN	0		N	F	R	N	4738 ft		McCullough Mountains
P	48	GE	SN	0		W	P	R	N	4272 ft		McCullough Mountains
P	49	RT	SN	3	11 S 671005 3947647	NW	G	R	Y	4194 ft	adult incubating; 2 chicks in nest	McCullough Mountains
P	50	GE	SN	0		W	P	R	N	4176 ft		McCullough Mountains
P	51	CR		1	11 S 670443 3949114					4100 ft	observed in flight	McCullough Mountains
P	52a	GE	SN	0		N	G	R	Y	4093 ft		McCullough Mountains
P	52b	GE	SN	0		N	G	R	N	4093 ft		McCullough Mountains
Flight #3 - [16:30 - 18:40] 75-69°F, 0% cloud cover, 0-5mph, 0% precip, 10+ mile visibility												
Observers: C. Meador, J. Wells, R. Rivard												
P	53	CR		1	11 S 652227 3958571					3197 ft	observed in flight	Ivanpah Valley

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	54	RT	SN	0	11 S 677845 3957060		G	TT	N	2544 ft	nice bowl	Eldorado Valley
P	55	RT	SN	4	11 S 677759 3956847		G	TT	Y	2382 ft	adult incubating with 2 chicks and 1 egg (possibly a chick)	Eldorado Valley
P	56	RT	SN	0	11 S 677486 3956369		F	TT	N	2513 ft		Eldorado Valley
P	57	RT		1	11 S 672167 3948816					3662 ft	observed in flight	McCullough Mountains
P	**58**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**4028 ft**		**McCullough Mountains**
P	59	RT	SN	0	11 S 671719 3945564	S	F	R	N	4056 ft		McCullough Mountains
P	**60**	**GE**	**SN**	**0**		**SE**	**P**	**R**	**N**	**4641 ft**		**McCullough Mountains**
P	61	TV		2	11 S 669383 3945666					4686 ft	observed in flight	McCullough Mountains
P	62	TV		1	11 S 667908 3944473					5138 ft	observed in flight	McCullough Mountains
P	63	RT	SN	1	11 S 667258 3940261	N	G	R	Y	5762 ft	adult incubating on possible old GESN	McCullough Mountains
P	64	RT		1	11 S 664625 3933442					6035 ft	observed in flight	McCullough Mountains
P	65	RT	SN	2	11 S 664180 3932259	N	G	R	Y	5606 ft	2 young in nest	McCullough Mountains
P	66	CR	SN	3	11 S 667719 3931262		G	TT	Y	5085 ft	adult and 2 chicks on nest	McCullough Mountains
P	67a	RT	SN	1	11 S 668452 3932241		G	TT	Y	5204 ft	adult incubating	McCullough Mountains
P	67b	RT	SN	0	11 S 668452 3932241			TT	N	5204 ft		McCullough Mountains
P	68	RT	SN	0	11 S 668671 3932523		F	TT	N	5227 ft		McCullough Mountains
P	69	RT	SN	0	11 S 669314 3933430			TT	N	5215 ft		McCullough Mountains
P	70	RT	SN	3	11 S 669731 3933982		G	TT	Y	5197 ft	adult and 2 chicks In nest	McCullough Mountains
P	71	CR	SN	2	11 S 670217 3934656		G	TT	Y	5088 ft	1 or 2 young	McCullough Mountains
P	72	RT	SN	0	11 S 670394 3934901		F	TT	N	5066 ft		McCullough Mountains
P	73	RT	SN	1	11 S 670526 3935076		G	TT	Y	5029 ft	adult incubating	McCullough Mountains
P	74	RT	SN	0	11 S 670774 3935419		F	TT	N	5008 ft		McCullough Mountains

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	75	RT	SN	1	11 S 671490 3936379		G	TT	Y	4906 ft	1 young	McCullough Mountains
P	76	RT	SN	0	11 S 672660 3938948		F	TT	N	4685 ft		Highland Range
P	77	RT	SN	1	11 S 672708 3939208		G	TT	Y	4678 ft		Highland Range
P	78	RT	SN	0	11 S 672798 3939759		G	TT		4613 ft		Highland Range
P	79a	RT	SN	0	11 S 673118 3941751		F/P	TT	N	4407 ft		Highland Range
P	79b	RT	SN	3	11 S 673118 3941751		G	TT	Y	4407 ft	3 chicks in nest	Highland Range
P	80	RT	SN	0	11 S 673520 3943701		P	TT	N	4141 ft	old remnants of nest	Highland Range
P	81	CR	SN	0	11 S 673678 3944767		F	TT	N	3999 ft		Highland Range
P	82	RT	SN	0	11 S 673734 3945047		F	TT	N	3955 ft		Highland Range
P	83	U	SN	0	11 S 673801 3945435		F	TT	N	3882 ft		Highland Range
P	84	RT	SN	0	11 S 673979 3946599		F	TT	N	3793 ft		Highland Range
P	85	RT	SN	1	11 S 674022 3946989		G	TT	Y	3753 ft	adult incubating	Highland Range
P	86	RT	SN	0	11 S 674095 3947417		P	TT	N	3699 ft		Highland Range
P	87	RT	SN	0	11 S 674411 3949030		P	TT	N	3534 ft		Highland Range
P	88	RT	SN	0	11 S 677913 3949253	S	G	R	Y	3299 ft		Highland Range
P	89	RT	SN	0	11 S 677852 3949071	S		R		3318 ft		Highland Range
P	**90**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**4112 ft**		**Highland Range**
P	**91**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**4208 ft**		**Highland Range**
P	92	RT	SN	0	11 S 676616 3947431	E	P	R	N	4368 ft		Highland Range
P	**93**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**4399 ft**		**Highland Range**
P	**94a**	**GE**	**SN**	**3**		**NE**	**G**	**R**	**Y**	**4018 ft**	**adult incubating with 2 chicks; prey visible in nest**	**Highland Range**
P	**94b**	**GE**	**SN**	**0**		**NE**	**F/P**	**R**	**N**	**4018 ft**		**Highland Range**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	95	GE	SN	0		E	F	R	N	4139 ft		Highland Range
P	96	GE	SN	0		E	P	R	N	4330 ft		Highland Range
P	97a	GE	SN	0		NE	P	R	N	4021 ft		Highland Range
P	97b	GE	SN	0		NE	P	R	N	4021 ft		Highland Range
P	97c	GE	SN	0		NE	P	R	N	4021 ft		Highland Range
P	97d	GE	SN	0		NE	G/F	R	N	4021 ft		Highland Range
P	97e	GE	SN	0		NE	G/F	R	N	4021 ft		Highland Range
P	98	RT	SN	0	11 S 676936 3945259	E	F	R	N	4436 ft		Highland Range
P	99	GE	SN	0		NE	P	R	N	4343 ft		Highland Range
P	100	GE	SN	0		NE	F	R	N	4395 ft		Highland Range
P	101	U	SN	0	11 S 677697 3943669	W	G	R		4427 ft		Highland Range
P	102	GE	SN	0		W	P	R	N	3986 ft	deteriorated	Highland Range
P	103	GE	SN	0		E	P	R	N	4115 ft		Highland Range
P	104	GE	SN	0		E	P	R	N	4139 ft		Highland Range
P	105	GE	SN	0		E	F	R	N	4142 ft		Highland Range
P	106	GE	SN	0		NE	P	R	N	4359 ft	deteriorating	Highland Range
P	107	GE	SN	0		NE	G	R	N	4438 ft		Highland Range
P	108	RT	SN	0	11 S 678797 3941783	E	G	R		4275 ft		Highland Range
P	109	RT	SN	0	11 S 680485 3944620	SW	F	R	N	3825 ft		Highland Range
P	110	RT		1	11 S 677023 3953645					2813 ft	perched on transmission tower	Highland Range
P	111	CR		1	11 S 652317 3958134					3396 ft	observed in flight	Ivanpah Valley
P	112	GE		1						3433 ft	observed in flight	Sheep Mountain

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
(4/28/2011) - 2 flights, flight #1 - [7:50 - 9:55] 56-64°F, light high haze 10-23% cloud cover, 0-5mph, 0% precip, 10+ visibility												
Observers: C. Meador, J. Wells, R. Rivard												
P	113	RT		1	11 S 676257 3945839					4198 ft	juvenile observed in flight	Highland Range
P	114	RT		1	11 S 676279 3945623					4152 ft	adult observed in flight	Highland Range
P	**115**	**RT (GE)**	**SN**	**2**		**N**	**G**	**R**	**Y**	**4150 ft**	**2 young in nest; old GESN**	**Highland Range**
P	116	BHS		15	11 S 676421 3946786					4590 ft		Highland Range
P	117	RT		1	11 S 676497 3946502					4815 ft	juvenile observed in flight	Highland Range
P	119	CR		2	11 S 675552 3944060					4310 ft	observed in flight	Highland Range
P	120	RT		1	11 S 675650 3943591					4662 ft	adult observed in flight	Highland Range
P	**121**	**GE**	**SN**	**0**		**W**	**G**	**R**	**N**	**4373 ft**		**Highland Range**
P	122	CR	SN	0	11 S 676718 3941085	W	P	R	N	4721 ft	old CRSN	Highland Range
P	123	XX			11 S 676101 3938288					4972 ft	metadata towers	Highland Range
P	124	RT	SN	0	11 S 680406 3945027	N	P	R	N	3757 ft	old RTSN	Highland Range
P	125	PR	CN	3	11 S 677865 3942684	W	G	R	Y	4483 ft	adult with several chicks, confirmed 2	Highland Range
P	126	BHS		4	11 S 678218 3942502					4684 ft	ewe, yearling, lamb and unknown age	Highland Range
P	127	U	SN	0	11 S 676850 3941600	SW	G	R		4780 ft		Highland Range
P	128	RT	SN	1	11 S 677417 3941066	E	G	R	Y	4398 ft		Highland Range
P	129	RT		1	11 S 677313 3939259					4466 ft	adult observed in flight	Highland Range
P	130	RT		1	11 S 677170 3939012					4503 ft	adult observed in flight	Highland Range
P	131	RT	SN	3	11 S 677071 3938976	NW	G	R	Y	4438 ft	3 chicks in nest	Highland Range
P	**132**	**GE**	**SN**	**0**		**NW**	**P**	**R**	**N**	**4695 ft**	**old nest**	**Highland Range**
P	133	U	SN	0	11 S 678164 3940416	S		R		4199 ft	CR/RT	Highland Range

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	134	PR		1	11 S 678219 3940535					4298 ft	observed kiting	Highland Range
P	135	RT	SN	4	11 S 678805 3938291	E	G	R	Y	4319 ft	adult brooding with 3 chicks	Highland Range
P	136	RT	SN	0	11 S 678889 3938196	E	P	R	N	4220 ft	old RTSN	Highland Range
P	**137**	**GE**		**1**						**4563 ft**	**observed in flight; perched on yucca; whitewash observed on tail, suspect this adult has chicks in nest nearby**	**Highland Range**
P	138	RT		1	11 S 666914 3956190					3436 ft		McCullough Mountains
P	139	RT		1	11 S 666950 3956335					3381 ft		McCullough Mountains
P	140	BHS		8	11 S 666524 3957576					3925 ft		McCullough Mountains
P	141	TV		2	11 S 665119 3956714					4207 ft		McCullough Mountains
P	**142**	**GE**		**1**						**3553 ft**	**perched on transmission tower**	**McCullough Mountains**
P	143	CR		1	11 S 650010 3944561					3035 ft		Ivanpah Valley
P	144	CR	SN	1	11 S 649958 3944398		G	TT	Y	3057 ft	adult incubating	Ivanpah Valley
flight #2 - [10:40-11:45] 70-74°F, ~10% cloud cover, 0-5mph, 0% precip, 10+ visibility												
Observers: C. Meador, J. Wells, R. Rivard												
P	145	RT		1	11 S 644045 3946934					3263 ft	observed in flight	Clark Mountain - North
P	146	WB		2	11 S 642983 3942410					3116 ft		Clark Mountain - North
P	147	CR	SN	1	11 S 642473 3941657		G	TT	Y	3012 ft	adult incubating	Clark Mountain - North
P	148	CR		1	11 S 642653 3941772					2932 ft	observed in flight	Clark Mountain - North
P	149	CR	SN	0	11 S 641652 3941391		G	TT		3068 ft		Clark Mountain - North

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	150	CR	SN	1	11 S 639127 3940805		G	TT	Y	3257 ft	adult incubating	Clark Mountain-North
P	151	RT		1	11 S 632834 3939599					4272 ft	perched on transmission tower	Clark Mountain-North
P	152	RT	SN	1	11 S 630936 3940040		G	TT	Y	4893 ft		Clark Mountain-North
P	153	MD		4	11 S 630972 3934397					5842 ft		Clark Mountain- East
P	**154**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**6723 ft**	**old nest**	**Clark Mountain- East**
P	**155**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**6657 ft**	**old nest**	**Clark Mountain- East**
P	**156**	**GE**	**SN**	**0**		**NE**	**F**	**R**	**N**	**6715 ft**		**Clark Mountain- East**
P	157	RT	SN	1	11 S 629308 3927613	SE	G	R	Y	5189 ft	adult incubating	Mountain Pass
P	158	RT		1	11 S 629280 3927527					5110 ft	observed in flight	Mountain Pass
P	**159**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**5216 ft**	**old nest**	**Mountain Pass**
P	**160a**	**GE**	**SN**	**0**		**N**	**F/P**	**R**	**N**	**5815 ft**		**Mountain Pass**
P	**160b**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**5815 ft**		**Mountain Pass**
P	**160c**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**5815 ft**	**very old**	**Mountain Pass**
P	161	TV		1	11 S 647980 3955711					3200 ft	observed in flight	Ivanpah Valley
(4/29/2011) - 3 flights, flight #1 - [5:52-8:02] 58-64°F, 0% cloud cover, 1-8mph, 0% precip, 10+ visibility												
Observers: J. Lincer, R. Rivard, C. Meador												
P	162	RT	SN	3	11 S 626985 3930583	ESE	G	R	Y	6267 ft	adult on nest with egg, adult flying nearby	Clark Mountain-South
P	**163a**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**6056 ft**		**Clark Mountain-South**
P	**163b**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**6056 ft**	**old**	**Clark Mountain-South**
P	**164**	**RT (GE)**	**SN**	**0**		**E**	**F**	**R**	**Y**	**5849 ft**	**RT built on GESN**	**Clark Mountain-South**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	165	GHO		1	11 S 628050 3929904					5811 ft	observed in flight	Clark Mountain-South
P	**166**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**6060 ft**		**Clark Mountain-South**
P	**167**	**GE**	**SN**	**0**		**E**	**P**	**R**	**N**	**6392 ft**		**Clark Mountain-West**
P	**168**	**GE**	**SN**	**3**		**W**	**G**	**R**	**Y**	**6274 ft**	**adult brooding with 2 chicks**	**Clark Mountain-West**
P	**169**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**6756 ft**		**Clark Mountain-West**
P	**170**	**GE**	**SN**	**0**		**W**	**P**	**R**	**N**	**6777 ft**	**old nest**	**Clark Mountain-West**
P	**173**	**GE**	**SN**	**0**		**N**	**F**	**R**	**N**	**6852 ft**	**smaller nest on top of GESN**	**Clark Mountain- East**
P	**174**	**GE**	**SN**	**0**		**N**	**P**	**R**	**N**	**6667 ft**		**Clark Mountain- East**
P	175	CR		1	11 S 628532 3931461					6838 ft	observed in flight	Mountain Pass
P	**176**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**5207 ft**		**Mountain Pass**
P	177	CR		2	11 S 629585 3924907					5310 ft	observed in flight	Mountain Pass
P	**178**	**GE**	**SN**	**0**		**N**	**G**	**R**	**Y**	**5374 ft**	**new material**	**Mountain Pass**
P	179	GHO		1	11 S 635148 3923660					5619 ft	observed in flight	Mountain Pass
P	180	RT	SN	1	11 S 634521 3924011	E	G	R	Y	5412 ft	adult incubating	Mountain Pass
P	181	RT	SN	0	11 S 631250 3924007	E	P	R	N	5378 ft		Mountain Pass
P	182	RT	SN	4	11 S 628670 3923356	SE	G	R	Y	5025 ft	adult incubating on 2 eggs, other adult flying nearby	Mountain Pass
flight #2 - [9:39-11:48] 73-68°F, 0% cloud cover, 4-12mph, 0% precip, 10+ visibility												
Observers: J. Lincer, R. Rivard, C. Meador												
P	**183**	**GE**	**SN**	**0**		**S**	**F**	**R**	**N**	**3689 ft**		**McCullough Mountains**
P	**184a**	**RT (GE)**	**SN**	**3**		**E**	**G**	**R**	**Y**	**3376 ft**	**3 chicks; on old GESN**	**McCullough Mountains**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	184b	RT	SN	0	11 S 675205 3969870	E	P	R	N	3376 ft	small nest below 184a	McCullough Mountains
P	**185**	**GE**	**SN**	**0**		**NE**	**P**	**R**	**N**	**3457 ft**		**McCullough Mountains**
P	**186a**	**GE**	**SN**	**0**		**SE**	**F**	**R**	**N**	**3865 ft**		**McCullough Mountains**
P	**186b**	**GE**	**SN**	**0**		**SE**	**F**	**R**	**N**	**3865 ft**	**smaller nest in cavity**	**McCullough Mountains**
P	187	RT	SN	1	11 S 678366 3971806	SE	G	R	Y	2761 ft	one chick	McCullough Mountains
P	**188**	**GE**	**SN**	**0**		**SE**	**F**	**R**	**N**	**3049 ft**		**McCullough Mountains**
P	189	RT	SN	3	11 S 676354 3969929	E	G	R	Y	2986 ft	3 chicks	McCullough Mountains
P	190	U	SN	0	11 S 675098 3968175	E	F/P	R	N	3269 ft	likely RTSN	McCullough Mountains
P	**191**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**2815 ft**	**large nest**	**McCullough Mountains**
P	192	RT	SN	2	11 S 675763 3966389	W	G	R	Y	2875 ft	adult on edge of nest and at least 1 chick	McCullough Mountains
P	**193**	**GE**	**SN**	**0**		**N**	**F**	**R**	**N**	**2671 ft**		**McCullough Mountains**
P	194a	RT	SN	0	11 S 675953 3965763	S	P	R	N	2385 ft		McCullough Mountains
P	194b	RT	SN	0	11 S 675953 3965763	S		R	N	2385 ft		McCullough Mountains
P	195	TV		1	11 S 675946 3965624					2410 ft		McCullough Mountains
P	196	CR	SN	1	11 S 675952 3965587	N	G	R	Y	2440 ft	adult incubating	McCullough Mountains
P	197	RT		1	11 S 673289 3964330					2901 ft	observed in flight	McCullough Mountains
P	198a	CR		1	11 S 671736 3965033					3273 ft	observed in flight	McCullough Mountains
P	198b	CR	SN	0	11 S 671736 3965033	S	G	R	Y	3273 ft		McCullough Mountains
P	199	U	SN	0	11 S 674317 3968309	E	F	R	N	3643 ft		McCullough Mountains
P	200	PE		1	11 S 674632 3968946					3592 ft	observed in flight	McCullough Mountains
P	201	RT	SN	0	11 S 674621 3968900		F	R	N	3456 ft		McCullough Mountains
P	**202**	**GE**	**SN**	**0**		**E**	**F**	**R**	**N**	**3808 ft**		**McCullough Mountains**
P	**203**	**GE**	**SN**	**0**		**E**	**G**	**R**	**Y**	**3873 ft**	**possibly used last year**	**McCullough Mountains**

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
P	204	GE	SN	0		SE	G	R	Y	3970 ft		McCullough Mountains
P	205	GE	SN	1		SE	G	R	Y	3992 ft	yucca décor, 1-week old chick	McCullough Mountains
flight #3 - [12:25-14:33] 68-58°F, 0% cloud cover, 8-12mph, 0% precip, 10-5+ visibility												
Observers: J. Lincer, R. Rivard, C. Meador												
P	211a	GE	SN	0		N	G	R	P	4857 ft		Mountain Pass
P	211b	GE	SN	0		N	G	R	P	4857 ft		Mountain Pass
P	212	CR	SN	3	11 S 629739 3926053	N	G	R		5108 ft	3 young in nest	Mountain Pass
P	213	RT		1	11 S 628895 3926122					5085 ft		Mountain Pass
P	214	WB		1	11 S 628509 3925955					5040 ft	black in color	Mountain Pass
(5/25/2011) - 2 flights, flight #1 - [9:00-12:00] 70-83°F, 0% cloud cover, 0-5 mph wind, 0% precip, 10 visibility												
Observers: J.D. Bittner, C. Meador												
V	15	GE	SN	0		NW	G	R	Y	5362 ft	(P178)	Mountain Pass
flight #2 - [17:00-17:30] 91-90°F, 10-15% cloud cover, 15-20 mph wind, 0% precip, 6 vis												
Observers: J. D. Bittner, C. Meador												
											too windy to band/survey	
(5/26/2011) -2 flights, flight #1 - [8:15-13:45] 65-84°F, 50-20% high cloud cover, 8-25 mph wind, 0% precip, 10+ visibility												
Observers: J.D. Bittner, C. Meador												
V	16	GE	SN	2		E	G	R	Y	4373 ft	newly observed nest; adult on nest with chick 4-5 weeks old, LaPre nest (desert tortoise prey)	Umberci Mine
V	17	GE	SN	2		N	G	R	Y	3992 ft	2 chicks in nest, 8 weeks old (P10)	Lucy Grey Mountains
flight #2 - [17:00-18:40] 85-78°F, 20-10% high cloud cover, 10-20 mph wind, 0% precip, 8-6 visibility												
Observers: J.D. Bittner, C. Meador												
V	18	GE	SN	2		N	G	R	Y	3948 ft	2 chicks in nest, ~7 weeks old (P94a)	Highland Range

Trip ID	Waypoint #	Species	Nest Type	# of Individuals	Position (UTM)	Nest Aspect	Nest Condition	Nest Substrate	Nest Active in 2011 (Yes/No/Possibly)	Elevation	Notes (age, sex, substrate, etc.)	Geographical Area
V	19	GE	SN	2		N	G	R	Y	3561 ft	newly discovered nest with 2 chicks, ~7 weeks old	Sheep Mountain
V	20	GE	SN	0		N	G	R	Y		(P5)	Sheep Mountain
(5/27/2011) - 2 flights, flight #1 - [5:30-6:30] 58°F, 0% cloud cover, 0-3 mph wind, 0% precip, 10 visibility												
Observers: J.D. Bittner, C. Meador												
V	21	GHO		2	11 S 669085 3954735					3350 ft	observed in flight	McCullough Mountains
V	22	GE	SN	0		N	G	R	Y	3401 ft	possibly used by GHO, hawk/eagle added sticks (P34)	McCullough Mountains
V	23	GE	SN	2		SW	G	R	Y	4035 ft	adult and chick ~7.5 weeks old; too old to band (P205)	McCullough Mountains
V	24	GE	SN	0		W	G	R	Y	3870 ft	(P204)	McCullough Mountains
V	25a	GE	SN	0		SW	P	R	Y	3893 ft	newly observed nest, some new material in nest	McCullough Mountains
V	25b	GE		1						3893 ft	observed in flight	McCullough Mountains
flight #2 - [8:30-10:50] 67-69°F, 0% cloud cover, 0-15 mph wind, 0% precip, 10 visibility												
Observers: J.D. Bittner, C. Meador												
V	26	GE	SN	0		NW	G	R	Y	6203 ft	chicks are gone, fledged? (P168)	Clark Mountain – West

BHS=Bighorn Sheep, CR=Common Raven, F=Fair, G=Good, GE=Golden Eagle, GHO=Great Horned Owl, MD= Mule Deer, ML= Mountain Lion, P=Poor, PE=Peregrine Falcon, PR=Prairie Falcon, R=Rock, RT=Red-tailed Hawk, SN=Stick Nest, TT= Transmission Tower, TV=Turkey Vulture, U=Unidentified, WB= Wild Burro, XX=Other.
*If no nest type is indicated, then the species was observed independently of a nest (e.g., flying, perched, etc.).

Table 4. All Data from Phase 1 and 2 Surveys of EITP Alignment.

Photographs of Golden Eagle Nests and Other Observations

Photo 8. Brooding golden eagle (P94aGESN-3) with visible prey in nest observed April 27th in McCullough Mountains (Phase 1).

Photo 9. The 2 McCullough golden eagle chicks (V18GESN-2) approximately 7 weeks old, observed May 25th (Phase2).

Photo 10. Golden eagle chick (P205GESN-1) approximately 3 to 4 weeks old observed April 25th in McCullough Mountains – North territory (Phase 1).

Photo 11. McCullough Mountains –North nestling (V23GESN-2) observed May 27th at approximately 7.5 weeks old (Phase 2).

Photo 12. Golden eagle with 2 chicks (P168GESN-3) observed in Clark Mountain – West territory April 29th (Phase 1). Chicks were not seen in nest during Phase 2 on May 27 th and may have fledged.

Photo 13. Two golden eagle chicks in nest (P10GESN-2) approximately 4 to 5 weeks old observed April 27th in Lucy Grey Mountains (Phase 1).

Photo 14. Active golden eagle nest (P5GESN-0) decorated with fresh yucca observed on April 27th at Sheep Mountain (Phase 1).

Photo 15. Adult golden eagle with chick in newly documented nest (V16GESN-2) with visible prey item observed on May 26th at Umberci Mine (Phase 2).

Photo 1. May 26th banding of 4.5 week old chick at Umberci Mine nest (V16GESN-2) indicated by yellow circle (Phase 2).

Photo 2. Close-up of WRI biologist, Chris Meador, banding Umberci Mine chick (V16GESN-2) on May 26th (Phase 2).

Photo 18. Golden eagle observed in flight over Sheep Mountain on April 27th (Phase 1).

Photo 19. Inactive golden eagle nest in good condition observed April 27th on Sheep Mountain (Phase 1).

Photo 20. Golden eagle nest in fair condition in McCullough Mountains (P33bGESN-0) observed on April 27th with white wash from this year (Phase 1).

Photo 21. Active golden eagle nest with new material recently added (P178GESN-0), observed April 29th at Mountain Pass (Phase 1).

Photo 22. Very large golden eagle nest (V19GESN-2) with 2 chicks approximately 7 weeks old. Nest newly identified on Sheep Mountain during Phase 2 surveys on May 26th (Phase 2).

Photo 23. Active golden eagle stick nest (V25aGESN-0) decorated with new material in 2011. Adult observed nearby in flight (Phase 2).

Photo 24. Adult golden eagle (P137GE-1) observed in flight, then perched on yucca in Highland Range (Phase 2). White wash noted on tail of eagle, a nest with young was suspected to be nearby.

Photo 25. Adult golden eagle (P142GE-1) observed perched on transmission tower in Highland Range (Phase 2).

DISCUSSION OF FINDINGS

WRI initiated Phase 1 aerial surveys on April 27, 2011, to determine golden eagle occupancy within the 4-nautical mile spatial buffer of the project alignment. Of the 19 total territories that were documented during Phase 1 surveys, 9 were documented as active/occupied; 5 of the 9 were observed to have signs of nest activity/preparation (i.e., fresh leafy branches or yucca incorporated into nest construction), and 4 were observed to be productive following the observation of at least 1 hatched chick in the nest (Clark Mountain, Highland Range, Lucy Grey Mountains, and McCullough Mountains – North).

Phase 2 aerial surveys to confirm productivity commenced May 25, 2011, approximately 30 days after completion of Phase 1 surveys in an attempt to document productivity within the biological window of golden eagle fledging. One new nest, comprising a new territory (Umberci Mine), was observed during Phase 2 based on information communicated to WRI by Dr. Larry LaPre, of the BLM. This nest was documented as productive with 1 chick observed in the nest, which was subsequently banded; thus raising the golden eagle territory total to 20 and the total active/occupied territory count to 10. Another new nest, with 2 chicks, was observed on Sheep Mountain, a territory previously identified in Phase 1 as active but not productive. Therefore, of the 10 active/occupied golden eagle territories documented within the approximate 4-nautical mile spatial buffer of the EITP alignment, 6 territories produced young (Clark Mountain – West, Highland Range, Lucy Grey Mountains, McCullough Mountains – North, Sheep Mountain, and Umberci Mine).

A total of 93 golden eagle nests, comprising 20 territories, were documented during Phase 1 and Phase 2 surveys of the EITP alignment. Of these 93 nests, 87 were located **within** the approximate 4-nautical mile spatial buffer including all 6 of the golden eagle nests that were productive for the 2011 breeding season. The 6 golden eagle nests that were documented outside the spatial buffer were located approximately 0.5 to 1.8 nautical miles outside the spatial buffer and were included in this report because the core nesting or foraging area associated with these nests **overlap** the spatial buffer. All of the golden eagle nests documented during these surveys appear to lie more than 4,000 feet outside the EITP alignment.

In total, 20 individual golden eagles (adults and chicks) were observed during the survey period. Incidental observations of other wildlife included 29 bighorn sheep, 27 common ravens, 7 great horned owls, 4 mule deer, 1 mountain lion, 1 peregrine falcon, 10 prairie falcons, 74 red-tailed hawks, 7 turkey vultures, and 3 wild burros totaling 183 unique wildlife documentations. Of the wild burros, 1 was suspected to display melanism.

All golden eagle nests and territories have been assigned a USGS Quad name, and all wildlife sightings have been documented with GPS locations and recorded on the attached tables, as recommended in the USFWS Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance (Pagel et al. 2010). Aerial surveys were conducted according to recommendations of the USFWS Draft Eagle Conservation Plan Guidance (Gould and Schmidt 2011).

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APPENDIX A
Wildlife Research Institute Golden Eagle Team

NOTE: Not all individuals, necessarily, participated in this survey.

Dave Bittner
Executive Director, WRI
Wildlife Biologist/Raptor Ecologist

Mr. Dave Bittner is a Co-founder and Executive Director of The Wildlife Research Institute, Inc. and has been a Wildlife Biologist for more than 44 years. Much of his work has been with raptors of various species but he has also studied and banded 3700 Great Blue Herons, conducted mammal research, and trapped and tagged over 3,000 mammals of various species. Dave currently coordinates an annual Golden Eagle and raptor population study throughout Southern California, including the Western Mojave Desert and the Anza-Borrego Desert State Park. He is the current Primary Investigator (P.I.) for the Southern California Golden Eagle Population Study, the longest continuous running Golden Eagle study of its kind in the Western Hemisphere starting in 1867. Dave's involvement began in 1968 in the Western Mojave but now includes all of Southern California. Currently, he is also the P.I. for WRI's satellite and VHF telemetry-based Golden Eagle migration and habitat use study in cooperation with the US Forest Service, Montana Parks and Wildlife, Nevada Dept. of Wildlife and the California Department of Fish and Game. WRI, under Dave's direction, has conducted annual helicopter surveys on Golden Eagles and raptors in general since 1996. Dave has banded thousands of raptors since 1963 and has banded over 480 Golden Eagles, over 150 with VHF and satellite telemetry. He has conducted Bighorn Sheep surveys, both aerial and ground, for Desert Bighorn Sheep in the Mojave Desert and for Peninsular Bighorn Sheep in the Anza-Borrego Desert State Park and Baja, Mexico since 1998. Dave has also surveyed Bighorn Sheep in Montana where WRI has a Research Station. His education includes a B.Sc. in Zoology and Wildlife Management from Ohio State University (1968). He also conducted graduate studies in Avian Reproduction and Natural Resources (1975-1977) at The Ohio State University. Dave has worked for the U.S. Fish and Wildlife Service, Cleveland Museum of Natural History, and the Ohio Department of Natural Resources and has taught at two universities and one technical college.

Jeffrey L. Lincer, Ph.D.
Research Director, WRI
Senior Scientist/Wildlife Biologist/Raptor Ecologist

Dr. Lincer is a Co-founder and Research Director of The Wildlife Research Institute, Inc. and has extensive experience surveying for raptors, including helping establish WRI's Montana Raptor Migration Station. He has actively participated in the institute's Southern California Golden Eagle project since 2000, including helicopter and ground surveys since 2001. He has conducted numerous raptor surveys for federal, state, county, and local governments, and the private sector across desert and mountain habitat in the California Mojave and Anza-Borrego deserts, San Diego County, Nevada and the mountains of northern Baja Mexico. In addition, Jeff has over 100 hours of aerial surveying for Bald Eagles and over 50 hours for fish-eating birds. He has conducted Bighorn Sheep surveys in the Mojave Desert and for the Anza-Borrego Desert State Park since 1998. Dr. Lincer's background includes 40 years as a scientist, scientific advisor, and administrator in the environmental research and management areas. He has taught college level courses in environmental and occupational health, environmental science, ornithology, and mangrove ecology, produced over 100

scientific publications and papers (most on raptors), authored dozens of environmental reports, and served as advisor to high-level governmental offices and national/international conservation programs. Jeff received his Bachelors and Masters degrees in Wildlife Biology/Wildlife Management from Syracuse University and his Doctorate in Ecology and Toxicology from Cornell University. He is most well-known for his work with raptors and other threatened/endangered species and his ability to manage complex interdisciplinary projects and work productively with government agencies. He is a Past-President of the Southern Chapter of The Wildlife Society. As President of the Raptor Research Foundation (RRF) from 1982 to 1988, he oversaw the greatest growth of that professional organization in its entire history. He chairs RRF's Leslie Brown Award Grant Committee (for research on African raptors) and chaired the First International Burrowing Owl Symposium and Workshop. He is the Co-editor for the Proceedings of the First International Symposium on Burrowing Owls, a Co-editor of the proceedings of the First California Burrowing Owl Symposium, and is a contributing Technical Editor for a recent book on California's endangered species. Dr. Lincer was the founding Director of the National Wildlife Federation's (NWF) Raptor Information Center. During his NWF tenure, he coordinated with government agencies and the private sector, developed computerized literature databases, and prioritized eagle and other raptor habitat throughout the United States for acquisition. He served as Consulting Editor for the joint RRF/Bureau of Land Management publication, "Raptor Habitat Management Multiple Use Mandate." Over the last four decades, he has worked on major projects from Alaska to Africa, addressing raptor population trends, ecological monitoring, environmental impacts, ecotoxicology, and habitat protection and acquisition.

Leigh Bittner
Vice-President, WRI
Field Assistant

Mrs. Bittner first flew Golden Eagle helicopter surveys in 1996. She has participated in Golden Eagle nest surveys, nest observations, eagle banding, tagging and tracking in California since 1991, New Mexico, 2001 and Montana since 2000. Leigh has also been involved in tagging and releasing of some of the first California Condors in California, 1992, and Arizona, 1996. Leigh is a co-founder of the Wildlife Research Institute, Inc. and has been a Board member since 1996. She is a retired Marketing Manager from Hallmark Corporation and also helps coordinate office operations to support WRI's field activities.

Chris Meador
WRI Assistant Director
Wildlife Biologist

Mr. Meador is a full-time Wildlife Biologist for the Wildlife Research Institute (WRI) and has been a Wildlife Biologist for the past eight years. Chris started conducting helicopter surveys on Golden Eagles and other raptors in 2008, including over 225 hours of helicopter survey experience. He has conducted numerous raptor surveys for federal, state, county and local governments, and the private sector across desert, coastal and mountain habitats. He co-leads WRI's Southern California Golden Eagle Population Study, the longest running study of its kind in the Western Hemisphere and has participated in it for the past ten years. He currently carries out myriad tasks as the project manager for various projects pertaining to the Golden Eagle. These include observation, trapping, tagging, and affixing radio and satellite telemetry transmitters to

nestling, juvenile and adult Golden Eagles in San Diego County as well as migrating Golden Eagles in Montana. He maintains and oversees much of the Wildlife Research Institute's tracking process including gathering, interpreting and publishing data and findings using GPS and GIS integration. Chris has conducted Bighorn Sheep surveys, both aerial and ground, in the Mojave Desert and for the Anza-Borrego Desert State Park since 2008. He has assisted with projects, including research, education and reintroduction on a broad range of species from endangered mammals (black-footed ferret) to sensitive fish, black-tailed prairie dog and from Burrowing Owls to Desert Tortoises. Mr. Meador also conducts educational programs on multiple topics including natural history, ecology and conservation pertaining to many different species. He is an expert in identification and ecology of North American raptors. He holds a Bachelor of Arts degree with a double major in Environmental Studies and Psychology from Prescott College in Prescott, Arizona.

James Hannan, Ph.D.
Senior Wildlife Biologist
Dr. Hannan has experience with WRI conducting helicopter surveys of Golden Eagles and other raptors since 2002. Jim also helps on WRI's long running Golden Eagle Research project with nest observation, rappelling to, banding and tracking Golden Eagles since 2000. Jim, started Golden Eagle migration counts and banding in Montana in 2001. He is fluent in Spanish and served as an International Environmental Consultant for the Peace Corps and United Nations Volunteer programs His professional experience includes two years as a Peace Corps Volunteer (fisheries and agriculture, in Panama), one-year Peace Corps staff (fisheries development in Puerto Rico), and one year at the Smithsonian Institution. His academic experience also includes three years as Professor of Marine Biology and Environmental Studies at Florida Institute of Technology. Jim also spent twelve years as a private environmental consultant (contracts included Mexican aquaculture, impacts to Caribbean coral reefs, deer and other game studies involving radio transmitters for the California Dept. of Fish and Game). He also served as a Texas game ranch manager, naturalist for East Africa wildlife filming company, fishery management advisor for the Florida Keys and holds a NAUI diver certificate and Florida EMT certificate. Dr. Hannan, is a WRI Senior Wildlife Biologist and Professor, Mesa College. He received his BS in 1965 from Humboldt State University, his MS in 1969 from University of Oregon, and his PhD in 1973 from the University of Miami (FL).

Daniel Palmer
Wildlife Biologist
Daniel received his Bachelor of Science in Biology from San Diego State in 2002 and has conducted graduate studies since that time. He is an experienced biologist, who has worked on a number of projects throughout Southern California for WRI and the USGS. WRI projects included surveys and monitoring for burrowing owls on private land and March Air Reserve Base, and golden eagle ground and aerial surveys on private property, State Park property, and US Forest Service land. Daniel has trapped for burrowing owls in order to assist with banding and relocation, and he has trapped for golden eagles in order to assist with banding, tagging, and satellite transmitter placement. He has also assisted with several banding trips, which included banding, tagging, and the placement of satellite transmitters on several golden eagle nestlings. During his work with WRI during 2011, Daniel logged well over 320 hours of survey time with golden

eagles, as well as over 300 hours of monitoring and observation time for golden eagles and 23 other species of raptors. Before WRI, Daniel had worked for the USGS surveying for bats and Arroyo toads (*Anaxyrus californicus*) on US National Forest Service land, California State Park land, California Fish and Game reserves, Bureau of Land Management property, and on Marine Corps Base Camp Pendleton. Daniel decided to switch his focus back to raptors before becoming part of the WRI team. He has been a raptor biologist and observer for most of his biology career, and some of his recorded raptor data dates back to 1999.

Katie Quint
Wildlife Biologist
Ms. Quint received her Bachelor of Science in Zoology with a minor in Psychology from North Carolina State University in 2010. Part of her academic experience involved keeping and training over 60 species of captive ungulates, small mammals, reptiles, and birds at both accredited and non-profit private zoos in Hawaii and North Carolina, respectively. She has committed herself to volunteer efforts for various animal shelters and zoos since 2007, where she specializes in designing and presenting educational programs in addition to providing animal care. Ms. Quint has one year of helicopter survey experience along with participation in banding events and California desert ground surveys with WRI.

Renée Rivard, Pharm.D.
Wildlife Biologist
Dr. Rivard is currently a member of the Wildlife Research Institute's Golden Eagle team; she has accumulated over 225 hours of aerial survey time while participating in more than 18 golden eagle projects conducted by WRI since 2010 for numerous renewable energy projects across desert and mountain habitat in the California Mojave desert, San Diego and adjacent counties, and Nevada. In addition to participating in aerial transect surveys and ground surveys to identify golden eagle nests and territories impacted by renewable energy projects, she has also participated in WRI's ongoing golden eagle research and monitoring project in San Diego County as a member of the banding and telemetry teams. She maintains the Golden Eagle Database and helps maintain Burrowing Owl artificial burrows on premises at WRI headquarters and continues to expand her knowledgebase related to these and other raptors. Renée assists with WRI's annual Hawk Watch educational program about the Ramona Grasslands and its raptor residents and migrants. Her 20+ years of database, scientific publishing, and medical research experience provide her with the background and skills to efficiently and professionally assimilate survey data for WRI, clients and agencies. Over the last 5 years, she has accumulated diverse and valuable wildlife knowledge and skills as a wildlife rescuer, rehabilitator, and veterinarian assistant for non-profit organizations in Australia and, more recently, as a field technician and laboratory technician for the San Diego Zoo's Institute for Conservation Research Applied Animal Ecology Department and Wildlife Disease Laboratory, respectively. Renée received her Bachelor's of Science in Biology from the University of South Alabama (1987), graduated *cum laude* with her Doctorate of Pharmacy from Creighton University (1995), and completed specialized post-graduate papers in medical literature evaluation from the University of Auckland in New Zealand (2001).

Brittany Schlotfeldt
Wildlife Biologist
Ms. Schlotfeldt has experience with mammals and birds and field transect experience in both the marine and desert environments. Brittany began conducting helicopter surveys of Golden Eagles and other raptors in 2010. She also started Golden Eagle and raptor counts on migration in Montana in 2010. Brittany assisted with the research on coral recruitment across various conditions in Hawaii (Donald Potts Lab, UCSC) and tracked sea otters for SORAC (Sea Otter Research and Conservation) at the Monterey Bay Aquarium. Brittany has also assisted with, and performed, a number of tasks in the upland and desert habitats for various Wildlife Research Institute (WRI) projects. In the desert environment, she has assisted with WRI's research on golden eagles (radio telemetry and tracking), burrowing owls (transect surveys, field observations, trapping, and banding), and desert tortoises (surveyed over 100 miles of protocol transects in the Western Mojave Desert with Drs. Boarman and Lincer, and Mr. Peter Woodman). This study, which was recently completed, was a follow-up on an earlier project focused on the potential impacts of vehicular traffic, and highway fencing, on tortoise mortality (Boarman and Sazaki 2006). She has additional experience with desert tortoises on Fort Irwin, where she conducted numerous surveys and assisted with the VHF-transmitting of tortoises in an effort to relocate the individuals. Ms. Schlotfeldt received her Bachelor's of Science in Marine Biology from the University of California, Santa Cruz (2008).

Jeff Wells
Wildlife Biologist
Mr. Wells has been involved with WRI's Golden Eagle research since 1991 including trapping, banding and tracking. Jeff has eleven years experience with WRI conducting helicopter surveys of Golden Eagles and other raptors. He has his Bachelors in Wildlife Studies from San Diego State University and has over 20 years experience as a private wildlife biologist. For the past 5 years, Jeff has been a Wildlife Biologist for the US Forest Service.

James Newland
Field Biologist
Mr. Newland has assisted WRI on Golden Eagle research starting in 2007. Since then James has assisted in banding, trapping, and VHF and satellite tracking. James has also assisted trapping and tracking Golden Eagles and other raptors at WRI's migratory research center in Montana starting in 2009. He has experience conducting helicopter surveys of Golden Eagles and other raptors since 2010. James has a Bachelor's of Science in Electrical Engineering and has worked for numerous large communication corporations.

Jeff Laws
Field Biologist/Bio-climber
Mr. Laws has assisted WRI with Golden Eagle research and field work since 1995. He has also assisted trapping and tracking Golden Eagles at WRI's migratory research center in Montana. Jeff has five year's experience conducting helicopter surveys of Golden Eagles and other raptors with WRI. Jeff works as a climber and field installer for San Diego Gas & Electric Company.

Mel Cain
Pilot, Utility Helicopters
Mr. Cain has more than 56 years experience flying helicopters for wildlife surveys. Utility Helicopters, with their Hughes-500 helicopters, has assisted WRI in Golden Eagle and raptor surveys for the last 11 years in the United States and Mexico. Mel has 13 years of experience in New Zealand trapping and transporting big game including deer and elk. He has conducted hundreds of netting and translocations of Bighorn Sheep and Tule Elk in California for California Fish and Game and California State Parks. Mel works frequently in Mexico and Canada and maintains NAFTA and Mexican permits to conduct wildlife and resource surveys.

Gregg Matson, M.D.
Pilot, Cherry Helicopters
Dr. Matson is a practicing physician who also started and headed a helicopter company in Hawaii to provide industrial and tourist services. Cherry Helicopters uses Hughes-500 helicopters to conduct these surveys. Gregg, WRI, and Cherry Helicopters have conducted wildlife surveys both in the United States and Mexico. He has supported WRI in aerial helicopter surveys of Golden Eagles, raptors and other wildlife for the last 9 years.

Barry Martin
Pilot, Western Tracking Institute
Mr. Martin is a WRI Research Associate and Director of the Western Tracking Institute. He has a Bachelor's in Business from Fresno State and an Associate's degree in Aeronautics. He has 43 years of flying experience and 22 years in the Navy with over 300 aircraft carrier landings. Concurrent with his Navy experience, he flew for over 21 years as a pilot for American Airlines. In total, Barry has over 20,000 hours of experience in the air. In 1989, Barry started the San Diego Tracking Team and started the Western Tracking Institute in 2007 to further expand his studies in wildlife populations and movements. In 2006, he started VHF tracking from aircraft primarily for mountain lions and 2 years later, began assisting WRI in aerial VHF tracking of Golden Eagles.

Kincaid-Arrington Transmission Project

Flora and Invasive Plants Survey Report

Eldorado-Ivanpah Transmission Project

Rare and Invasive Plants Survey Report

ELDORADO-IVANPAH TRANSMISSION PROJECT

RARE AND INVASIVE PLANTS

SURVEY REPORT

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AECOM

May 2011

INTRODUCTION

The proposed Southern California Edison (SCE) Eldorado-Ivanpah Transmission Project (EITP, project area) proposes to replace the existing 115 kilovolt (kV) Eldorado-Coolwater-Dunn Siding transmission line with a new 220kV line between the existing Eldorado Substation in the Eldorado Valley in Clark County, Nevada and the proposed Ivanpah Substation in San Bernardino County, California. The purpose of the project is to transmit power from a solar energy generation facilities proposed for construction in the Ivanpah Valley, near the border of California and Nevada along the I-15 corridor.

This Botanical Letter Report (BLR) represents the third year of botanical surveys that were started in 2008 (EPG 2008). Surveys were performed the spring and fall of 2008, as well as the spring of 2010 and 2011. This report was prepared to support permits from federal, state, and local agencies in Nevada and California. Existing transmission towers, proposed transmission towers, the Ivanpah Substation, proposed telecommunication retrofits of existing towers and associated facilities, all of the laydown areas (including recent modifications to date), and conductor and telecommunication cable pull sites were resurveyed for the following items:

- Invasive Weeds in Nevada and California
- Sensitive Plants in Nevada and California

A list of noxious weeds for Nevada (NDA 2005) and California (CDFA 2003) was consulted to determine status. Some of the sensitive plants within the project have special status from county, state, or federal agencies (AECOM 2010, Table 1 and 2). Typically the status is related to rarity in the environment or a potential to become scarce from development. Federally listed species include those recognized by the U.S. Fish and Wildlife Service (FWS) as threatened or endangered under the Endangered Species Act. The BLM may designate species at the State Directors Office as sensitive, and other species can be tracked by state and local programs. In California and Nevada species are tracked by various departments or programs and counties may have species conservation programs that are tracked by local or state agencies.

In Nevada the Department of Conservation and Natural Resources tracks species at risk. This data is compiled by the Nevada Natural Heritage Program (NNHP). The NNHP also assigns rank indicators to plant species based on rarity and perceived level of threat. Clark County, Nevada, has implemented a Multiple Species Habitat Conservation Plan that coordinates with the NNHP.

In California, sensitive plant species are tracked and monitored by the California Department of Fish and Game (CDFG) via their California Natural Diversity Database (CNDDB) and the California Native Plant Society's list of sensitive species is followed closely. The State of California through the Fish and Game Code may also formally designate plants by listing them as threatened or endangered.

Joseph Betzler, an SCE contingent employee with AECOM, and a contract biologist, Glenn Clifton, with the Environmental Planning Group (EPG) conducted invasive and rare plant investigations along the existing rights-of-way (ROW), the proposed ROW, and along a

proposed secondary telecommunication alternative supporting optic fiber ground wire (OPGW) placement with associated facilities related to the telecommunications route. The following letter report summarizes differences or additions to the 2010 botanical observations (AECOM 2010) made by biologists during the spring of 2011.

PROJECT DESCRIPTION

The project description follows the 2010 report (AECOM 2010). Briefly the Eldorado-Ivanpah Transmission Project (EITP) proposes to replace an existing 115kV transmission line between the existing Eldorado Substation in Boulder City, in Clark County, Nevada and the proposed Ivanpah Substation near Ivanpah Dry Lake in eastern San Bernardino County, California. Steel lattice towers or steel poles will replace existing structures to form the 220kV EITP. Due to the increased tower heights and span lengths it is likely that the majority of the new towers will be placed in new locations that will require construction of new temporary or permanent spur roads from the existing main access road. In one section of the project area, through the pass in the McCullough Range; the majority of the towers will be placed upon the existing tower locations.

The proposed Ivanpah Substation site is located on the west side of Ivanpah Dry Lake adjacent to the existing SCE right of way. In addition to the new optical ground wire (OPGW) on the new 220kV transmission line, a redundant telecommunications route for the telecommunications facilities associated with the Ivanpah Substation will be constructed using existing and new infrastructure. This redundant route will use new OPGW telecommunications line on the existing Eldorado-Lugo 500kV line that will be retrofitted to hold the new OPGW. The OPGW will depart from the Eldorado-Lugo transmission line and follow a new underground conduit within an existing road ROW. The underground conduit will turn north at Nipton and enter into a new microwave communication systems aimed at a similar microwave communication system at the Ivanpah Substation across the valley.

Survey Area Description

The EITP consists of about 35 miles of new transmission lines and 30 miles of secondary telecommunication line along routes from southern Clark County, Nevada into the eastern edge of San Bernardino County, California. The results of the 222 acre survey in 2010 were used as the basis for the 2011 surveys. The majority of the project is within Nevada. The Eldorado substation is the eastern terminus of the transmission and telecommunications project, within Boulder City, Nevada. The transmission route starts at the Eldorado substation and travels up the north edge of alluvial deposits to the McCullough Range and west across an unnamed pass through the mountains and descends the alluvial deposit descending toward the northern end of the Lucy Gray Mountains. From the Lucy Grey Mountains the line heads south and wraps around the eastern edge of Roach Dry Lake and crosses the Nevada-California border at Primm Nevada. Out of Primm the Transmission line will follow the existing transmission line corridor directly to the proposed Ivanpah Substation; the western terminus of the transmission line. The redundant telecommunication line extends south from the Eldorado Substation to Nevada State Route 164/Nipton Road then west on Nipton Road to Nipton California, ending at a microwave

transmission area. The entire project area was observed in 2011 with attention to rare and invasive plant locations discussed in 2010 (AECOM 2010).

METHODOLOGY

Two field biologists from SCE (AECOM contingent) and EPG surveyed locations along the project ROW on April 11, 12, 14 and 15, 2011. During the previous year the same biologists conducted plant surveys along the same area (AECOM 2010). Before that the same biologist from EPG conducted rare plant surveys in April, August and October of 2008 (EPG 2008). Surveys in 2011 were not intended to repeat the previous surveys, but to confirm rare plant locations from previous surveys, look for new species, and observe areas where expanding populations of invasive species may occur.

Surveys consisted of investigation near areas of known rare or invasive species to record the edges of plant subpopulations, looking for new species and or using intuitive controlled survey techniques outlined by the Bureau of Land Management (Whiteaker et al 1998). All coordinates are recorded in decimal degrees using the NAD 83 datum. Photo points and locations of all observations were recorded with a hand-held global positioning unit (GPS).

Equipment used for the surveys consisted of a primary GPS unit and a back-up, survey forms, digital camera, local floras and plant lists, detailed maps and project documents, four wheel drive vehicle to get to each site, plus proper clothing, and associated desert gear for safety.

Weather conditions for the survey dates were generally cool in the mornings; between 60 to 65 degrees Fahrenheit. The highest temperatures for the dates listed were about 90 degrees Fahrenheit. The air was generally breezy with strong winds during the last day of surveys. The cloud cover was high and broker to clear.

A list of sensitive species likely to occur in the area was compiled form the previous Biological Technical Report (EPG 2008) to assist in the location of species for the current survey. Nevada and California noxious weed lists (California 2003, Nevada 2005) were consulted to check current status of weeds noted along the survey area.

INVASIVE PLANT SPECIES

The following invasive plants were observed in the EITP project area, in order of scientific name:

Sahara mustard (*Brassica tournefortii*)

Sahara mustard (symbol BRTO) is an annual herb from 4 to 40 inches tall. Yellow flowers are borne at the end of inflorescences that are produced from January to June. This species is expanding its range and is able to grow in undisturbed desert areas; it is from Asia (Cal-IPC 2010, Baldwin 2002). This plant is considered a noxious weed in Nevada where it is on List B (NDA 2005)

Crossflower, purple mustard (*Chorispora tenella*)
Crossflower (symbol CHTE) or purple mustard is an annual herb 4 to 18 inches tall with large basin leaves. The purple flowers a borne on short inflorescences and reproduction is by seeds, it is from Europe (Baldwin 2002). It is common in waste places and agricultural areas. It is listed by California as a noxious weed on List B (CDFA 2003).

Russian thistle (*Salsola tragus*)
Russian thistle is an annual plant up to 3 feet tall that forms a rounded canopy of stiff stems. The leaves and small and form stiff bristles. The small flowers are greenish and inconspicuous. The plants grow in disturbed places (Hickman 1993). It is listed by California as a noxious weed on List C (CDFA 2003).

London Rocket (*Sisymbrium irio*)
London Rocket is an annual herb with basal leaves that are dissected. Flowers are yellow and form at the end of the stems, it is native to Europe (Hickman 1993). These plants grow near disturbed places where water pools in the winter, growing faster than the native plants in the spring (Cal-IPC 2011). This species is not listed by Nevada or California, but is listed by the California Invasive Plant Council. It was recorded because of its invasive nature along the EITP corridor, especially in the ephemeral washes and disturbed dry lake areas. There is a question of the identity of some of these plants; they may be *S. altissimum*. These plants seem to occur together in the project area. For the purposes of this document these plants will be referred to as *Sisymbrium irio*.

Tamarisk (*Tamarix* sp.)
Tamarisk is a shrub or small tree that can be found along wet areas in the desert. They are plants from Asia and India with pink to white flowers that are borne at the ends of the branches from May to July (Hickman 1993). This species is listed as a noxious weed in Nevada on the Category C Weed list (NDA 2005).

SPECIAL STATUS SPECIES

The following special status species were observed in the EITP project area, in order of scientific name:

Utah Vine Milkweed (*Cynanchum utahense*)
Utah vine milkweed (symbol CYUT) is a highly branched vine that grows on other shrubs for support. The plant typically grows on sandy to gravelly flats in creosote bush desert. The small yellow to orange flowers appear in April to June (Baldwin 2002). It has a state ranking of S3.3 (CDFG 2010) and a CNPS ranking on List 4.2 (CNPS 2010). The species was observed near the project area.

California Barrel Cactus (*Ferocactus cylindraceous*)
The California barrel cactus prefer gravelly to rocky hillsides, canyon walls and wash margins in the desert between about 200 and 5,000 feet. They occur in a wide area from Arizona, Nevada,

California, and Utah in desert habitats. Two varieties can occur: var. *lecontei* occurs from roughly between 2,500 and 5,000 feet while var. *acanthodes* occurs between 200 and 1,500 feet elevation. In Nevada it is protected, and observations of this species were recorded California (EPG 2008).

Parrish Club Cholla (*Grusonia parishii* syn: *Opuntia parishii*)
Parrish club cholla or matted cholla grows in sprawling mats. The species is known from the Mojave and Sonoran Deserts of Arizona, California, and Nevada. Flowers appear in May to June (Baldwin 2002). It has a CNDDB state ranking of S2.3 (CDFG 2010) and a CNPS ranking on List 2.2 (CNPS 2010). It is protected in California and Nevada. This plant was observed in the Ivanpah Substation site and other locations near the project area (EPG 2008) and Nevada.

White-margined Beardtongue (*Penstemon albomarginatus*)
The white-margined beardtongue is known from the Mojave Desert of southern Nevada, southeastern California, and northwestern Arizona. The leaves are white on the margins and the flowers are pink, borne on the plants from March to May (Baldwin 2002). Its range is limited to four discrete areas. This plant has a CNDDB state ranking of S1 (CDFG 2010) and a CNPS ranking on List 1B.1 (CNPS 2010). It is protected in California and Nevada. It is a former Category 2 Candidate for federal listing, is currently a federal species of concern, and is designated a sensitive species by the BLM in Nevada and California (BLM 2009). It is also listed as an "at risk" species by the State of Nevada Natural Heritage Program. This plant was observed in Nevada.

Yellow Two-toned Beardtongue (*Penstemon bicolor*)
The yellow two-toned beardtongue (symbol PEBI) grows in gravel soils, typically near washes. The perennial herbs have stems up to 5 feet tall, leaves have strongly toothed margins and are clasping (Baldwin 2002). The corolla is trumpet-shaped and the flowers are pale white to yellow and borne April to June. The BLM lists it as sensitive in Nevada. Specimens of this plant are present within the project area in Nevada.

Rosy Two-toned Beardtongue (*Penstemon bicolor* ssp. *roseus*)
The rosy two-toned beardtongue it is a calcareous soil obligate or near-obligate. The perennial herbs have stems up to 5 feet tall, leaves have strongly toothed margins and are clasping (Baldwin 2002). The corolla is trumpet-shaped and the flowers are rose to rose-purple and borne in April to June. This plant has a CNDDB state ranking of S1 (CDFG 2010) and a CNPS ranking on List 1B.1 (CNPS 2010). It is protected in California and Nevada. The BLM lists it as sensitive in Nevada and California. Specimens of this plant are present within the project area in Nevada.

Johnson's Beehive cactus (*Sclerocactus johnsonii* synonym: *Echinomastus johnsonii*)
Johnson's beehive cactus occurs in Creosote bush habitat on granitic soils and rocky habitats. The state of California assigns it a rank of S2.2 (CDFG 2010) and a CNPS ranking on List 2.2 (CNPS 2010). It is protected in California and Nevada. It was not observed in the project area in California, but is present in Nevada.

Cactus and Yuccas

In Nevada the BLM typically requires transplanting or salvage of cacti and yuccas and certain native plant species that may be lost to development on lands under their jurisdiction. In Nevada cacti and yuccas are protected, some are protected in California, and a revegetation plan will need to be submitted and approved. Salvage and replanting after development will be required for most of these plants.

RESULTS

Surveys within the EITP were made on April 11, 12, 14 and 15, 2011. A list of new observation data was compiled in Table 1. California and Nevada rare plants and weeds were noted in detail in 2010 (AECOM 2010). Table 1 below represents rare plants weeds that were not noted in 2010. These observations are discussed below in detail.

Table 1. Noted Waypoints for 2011 Survey

Waypoint	Symbol	Latitude	Longitude	Elevation (ft)
2011-01	PEBI	35.66244	-115.07440	3079.2
2011-02	BRTO	35.47442	-115.23459	3374.4
2011-03	CYUT	35.54459	-115.46522	3023.9
2011-04	CHTE	35.58168	-115.41825	2608.0

Invasive Weed Observations

There were no new weed species noted in 2011, but there were some increases in numbers. Sahara mustard (BRTO), waypoint 2011-02, was observed in the same location as 2010; east of Nipton, California. In 2011 the numbers increased substantially from five plants in 2010 to approximately 100 plants in 2011. This infestation is increasing in number and spreading slightly, all of the plants can be found along the north side of Nipton Road on the disturbed road edge within 50 feet of the waypoint.

Crossflower - more plants were observed in 2011 than in 2010.

Another increase was noted for Crossflower (CHTE) and London Rocket, also in the mustard family. These invasive plants were growing together at waypoint 2011-04 and along the road bed on Ivanpah Dry Lake from the west shoreline toward the east. Approximately 15 plants were noted of crossflower and approximately 100 of the London Rocket plants. Currently these plants are following a linear course along the road bed that parallels the transmission corridor. Crossflower was not observed outside of the dry lake bed and none were

seen in Nevada. London Rocket has been observed in washes near the Eldorado Substation in areas that are seasonally wet.

The other two invasive plants mentioned in the 2010 botanical report (AECOM 2010) have remained stable in their locations and numbers. These plants are: Russian thistle and Tamarisk.

Sensitive Plants Observed

In 2011 three sensitive plant species, in Nevada, were observed along the EITP, within the project area. These included: yellow two-toned beardtongue, rosy two-toned beardtongue, and white-margined penstemon. In California with the construction in progress of the Ivanpah Solar Electric Generating Systems (ISEGS) the appearance of the project area has changed with the addition of project fences and grading of the proposed Ivanpah Substation.

The sensitive plants that were reported in the 2010 report are: have been moved are: several sensitive plant species was missing from the project area: California barrel cactus, Parrish club cholla, and desert pincushion. These plants are present in Nevada and protected, many of these plants have been moved from reported locations in the area around the Ivanpah Substation within the ISEGS project perimeter.

Yellow Two-toned Beardtongue – showing its beardtongue.

Yellow two-toned beardtongue is a new record for the EITP found in 2011 near the redundant communications line route about 7 miles south of the Eldorado Substation at waypoint 2011-01. This plant is not directly in the way of construction but is near the tower spur road and may be protected with a temporary marker.

Missing from the project area within California during the 2011 survey was matted cholla (*Grusonia parishii*). These plants were within the Ivanpah Substation area which is now separated from the EITP ROW with a fence. These plants were moved (J. A. Betzler pers. observation) before construction; their original habitat has been converted to a level compacted construction area that will house the Ivanpah Substation in the future.

The rosy two-toned beardtongue specimens that were observed in Nevada in 2010 are still present in 2011 with no noticeable recruitment since 2010. The same situation exists for the white margined penstemons, though small seedlings were noted around one individual. New to the plant list in 2011 is the discovery of two-toned beardtongue, a rare plant that has not previously been observed in the study area for this project. This species has light colored flowers and resembles the rosy two-toned beardtongue without the pink color. A single specimen was

found along the alternate communications path south of the Eldorado Substation. A search to the west toward the McCullough Range discovered no other penstemon specimens in this vicinity.

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Eldorado-Ivanpah Transmission Project

Desert Tortoise Survey

SOUTHERN CALIFORNIA EDISON
ELDORADO-IVANPAH
TRANSMISSION LINE PROJECT

SURVEYS FOR DESERT TORTOISE AND OTHER SPECIAL-STATUS VERTEBRATES ON SELECTED PROJECT ELEMENTS - 2011

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EXECUTIVE SUMMARY

Southern California Edison (SCE) is proposing to develop the Eldorado-Ivanpah Transmission Project (Project) to provide transmission of power generated by several solar power projects proposed for Ivanpah Valley. The Project will include replacement of the existing Eldorado-Coolwater-Dunn Siding 115kV transmission line with a new double-circuit 220kV line between a new substation at the existing Eldorado Substation in Nevada and another new substation in Calilfornia, the Ivanpah Substation. The proposed Project and alternatives were surveyed in 2008, 2009 and 2010 to provide data for the analysis of Project effects, primarily on the desert tortoise (*Gopherus agassizii*), but also on other special-status animals. This report discusses the results of additional surveys on seven small potential Project elements on the Project routes: two helipads and five construction yards. Four of the five construction yards were surveyed in 2008, 2009, and/or 2010. The two helipads and the remaining construction yard were surveyed on buffer transects in 2008, 2009, and 2010.

The proposed helipads are largely or completely native habitat. By contrast, the proposed construction yards are mostly denuded or very heavily disturbed, except for the Nipton site, which had been completely graded but has early regrowth. All of the construction yards are adjacent to heavily disturbed or developed areas. No tortoise or other special-status species sign was observed on any site, although tortoise sign was found in buffer transects at Construction Yard Site 7 (Nipton) and outside Staging Area 2. Because of the habitat and the observations of tortoise sign in the immediate area on previous years' surveys, tortoises could inhabit these sites and Staging Area 1 in the future. Tortoises were also found in the surrounding area on the other sites and, while they would not inhabit these sites due to their fully degraded nature, they may use some sites for transit.

The only other special-status species sign observed was an old kit fox natal den on Staging Area 1. However, kit fox, burrowing owls and other species may be present on some sites in the future. On the sites that are essentially or completely denuded, impacts are likely to be negligible.

SOUTHERN CALIFORNIA EDISON
ELDORADO-IVANPAH
TRANSMISSION LINE PROJECT

SURVEY FOR DESERT TORTOISE AND OTHER SPECIAL-STATUS VERTEBRATES ON SELECTED PROJECT ELEMENTS –2011

1.0 INTRODUCTION

Southern California Edison (SCE) is proposing to develop the Eldorado-Ivanpah Transmission Project (EITP or Project) to provide the transmission of power generated by several solar power projects proposed for Ivanpah Valley. The Project will include replacement of the existing Eldorado-Coolwater-Dunn Siding 115kV transmission line with a new double-circuit 220kV line between a new substation at the existing Eldorado Substation in Nevada and another new substation in Calilfornia, the Ivanpah Substation.

The proposed Project and alternatives were surveyed in 2008, 2009 (Karl 2008 and 2010) and 2010 (Environmental Planning Group, Inc. [EPG] 2010) to provide data for the analysis of Project effects, primarily on the desert tortoise (*Gopherus agassizii*), but also on other special-status animals. The desert tortoise is the only listed species of those surveyed. It is a federally listed Threatened species in California and Nevada, a California state-listed Threatened species, a Nevada state-protected reptile, and a U.S. Bureau of Land Management (BLM) "sensitive" species. Detailed analyses of tortoise density and impacts to individuals, populations and habitats, as well as a suite of conservation recommendations were provided in the 2008-2009 survey report (Karl 2010), which is appended to this report for the reader's convenience. EPG also surveyed the Project for other special-status biological resources in 2008 through 2011, including rare plants, and conducted focused surveys for burrowing owls in 2011.

This report discusses the results of additional surveys on seven small potential Project elements on the Project routes: two helipads and five construction yards. Four of the five construction yards were surveyed in 2008, 2009, and/or 2010. The two helipads and the remaining construction yard were surveyed on buffer transects in 2008, 2009, and 2010.

2.0 PROJECT SETTING AND DESCRIPTION

2.1 Project Location and Environmental Setting

The Project extends for approximately 35 miles from the Eldorado Substation in Clark County, Nevada, to the proposed Ivanpah Substation in San Bernardino County, California (Figure 1). A telecommunications facility extends from Eldorado Substation through the McCullough Mountains and along Nipton Road.

The reader is referred to EPG (2008) for a detailed environmental description of the entire Project.

2.2 Project Elements Surveyed in 2011

Seven sites associated with the Project were surveyed in 2011. These included two potential helipad sites and five potential construction yards (Figure 2). Each is briefly described below:

(Helipad) Staging Area 1 – An approximately 1.2-ha (3-acre) site in McCullough Pass. This site was surveyed on buffer transects during 2009 and 2010 surveys.

(Helipad) Staging Area 2 - An approximately 1-ha (2.5-acre) site along the proposed 220-kV transmission line route, southwest of McCullough Pass. This site was surveyed on buffer transects during 2009 and 2010 surveys.

Construction Yard 2 - An approximately 5.5-ha (14-acre) site on the northern edge of the town of Jean, Nevada, abutting Interstate 15 (I-15) on the west and the old two-lane road to Las Vegas on the east. This site was part of the 2010 surveys.

Construction Yard 3 - An approximately 10.1-ha (25-acre) site intersected by a bridge and road that access an existing power plant, 0.5 mi (0.8 km) northeast of Primm, Nevada. Approximately 5.6 ha (14 acres) lies north of the bridge and 4.5 ha (11 acres) lies south. A slightly altered footprint of this site was part of the 2009 and 2010 surveys.

Construction Yard 4 - An approximately 7.7-ha (19-acre) site along the southeastern edge of the outlet mall at Primm, Nevada, just outside the northern edge of Ivanpah (Dry) Lake. This site was previously surveyed in 2009 and 2010.

Construction Yard 5 - An approximately 1.2-ha (3-acre) next to the fenced Primm casino and parking lot, just outside the northern edge of Ivanpah (Dry) Lake. This site was previously surveyed in 2009 and 2010.

Construction Yard 7 - An approximately 2.2-ha (5.5-acre) site on the southwestern edge of Nipton, California. The railroad and Nipton Road (Highway 164) border the eastern and northern borders of the site,

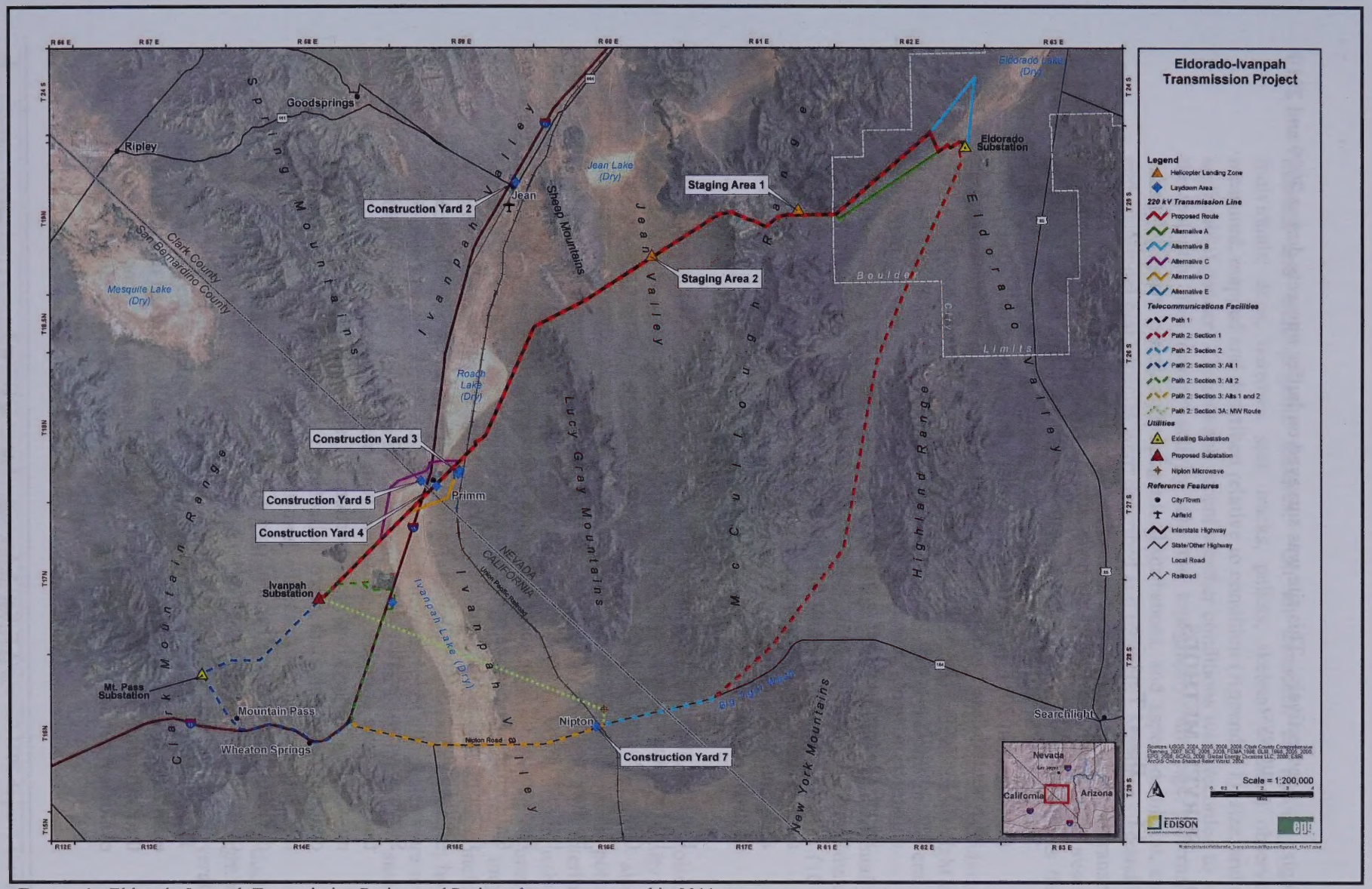

FIGURE 1. Eldorado-Ivanpah Transmission Project and Project elements surveyed in 2011.

respectively. This site was surveyed on buffer transects during 2009 and 2010 surveys.

3.0 SURVEY METHODS

3.1 Desert Tortoise

Even though the Project elements surveyed in 2011 were very small and generally degraded, full desert tortoise protocol surveys (United States Fish and Wildlife Service [FWS] 2010) were employed. For small sites such as those we surveyed for the Project in 2011, protocols require that surveys be completed at 100% coverage of all potential desert tortoise habitat in the Action Area, using 10-meter-wide (33-feet-wide) transects. The Action Area includes all areas in which tortoises may be directly and indirectly affected by a project's activities. For the potential Project helipads and construction yards surveyed, there are likely to be few to negligible additional impacts to tortoises over current levels, due to the highly degraded or disturbed nature of these Project elements and adjacent anthropogenic development and/or impacts. This, in combination with the fact that most of the sites were chosen because they already were highly degraded or naturally disturbed, supported the rationale that the footprints for each site would be sufficient as the Action Area and each was surveyed at 100% coverage.

For sites under 80 ha (200 acres) in size, FWS requires that a single, 10-meter-wide buffer transect be completed around the Project footprint at 200, 400, and 600 m (660, 1320, and 1980 ft) from the Project boundary. (Larger projects are not required to have buffer transects, and those exceeding a certain threshold size are permitted to be surveyed at <100% cover.) All of the Project sites were under 80 ha, so these buffer transects were walked. In addition, one was in California and the California Department of Fish and Game (DFG) and FWS have determined that projects in California, irrespective of the project size, must be surveyed at 100% of the project footprint, plus buffer transects at 200, 400, and 600 m (T. Engelhard, FWS Carlsbad Field Office, pers. comm. to A. Karl; R. Jones, DFG, pers. comm. to A. Karl).

Surveys were completed between 17 and 19 May 2011, inclusive. Pedestrian transects were completed consistent with methods described above, which included no walking surveys on those portions of sites that were bladed and *completely* denuded, although data were collected to identify the site's condition. Buffer transects also were truncated where they would cross I-15 (Construction Yard 3), developed areas (Construction Yard 4, 5, and 7), or playas (Construction Yard 4), all of which are not tortoise habitat.

The objectives of the FWS protocol surveys are to determine tortoise presence and to estimate tortoise density. Our surveys additionally collected data that would permit the evaluation of the potential for tortoises in the event that none was observed, and to evaluate potential Project impacts. These data included a detailed description of both

habitats and anthropogenic features. On all transects, all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains) observed was measured, mapped and described relative to condition (Appendix 1), size, and (where applicable) gender. Current and recent weather conditions were recorded to identify the potential for tortoise activity and the topography, drainage patterns, soils, substrates, plant cover, anthropogenic disturbances, and aspect-dominant, common and occasional plant species were described and mapped. Mapping sign and habitat features was achieved using Global Positioning System (GPS) units. All transect data were recorded on specially-designed forms (Appendix 1). Representative photographs were taken of all sites and any habitat on buffer transects that was different than the Project element footprint.

Two experienced tortoise biologists, Paul Frank and Art Schaub, conducted the surveys. Both were also familiar with the other special-status species sought and the Project vicinity habitats, having conducted Project surveys the previous several years.

Due to an unseasonal storm just prior to the survey, the weather was unusually cool, beginning in the mid teens shortly after dawn and reaching air temperature maxima of 29°C (84°F) by midday. Wind speeds were generally calm, <16 kph (10 mph), reaching about 16-24 kph (10-15 mph) on May 17.

3.2 Other Special-Status Species

Although the primary goal of the survey was to search for desert tortoise, other special-status species that have reasonable potential be in the survey vicinity - based on habitat (known from previous surveys), range and prior documentation - also were sought (Table 1). Each site's habitat was also evaluated for these species' potential if they were not observed, and impacts. Unusual avian migrants or wintering bird species were not included in the search list because impacts from planned activities at these sites generally would be negligible to non-nesting species. Nonetheless, biologists noted unusual migrants or non-breeding special-status birds if they were present. Similarly, special-status bats and other small mammals were not included in the search list because they require focused surveys to determine presence; however, all bat roosts observed were noted. Complete inventories of all species were recorded in previous years' surveys, so an additional inventory in 2011 for the few small sites surveyed was not recorded.

3.3 Project Personnel

Two experienced tortoise biologists, Paul Frank and Art Schaub, conducted the surveys. Both were also familiar with the other special-status species sought and the Project vicinity habitats, having conducted Project surveys the previous several years. Dr. Alice Karl directed the data collection and analyzed the data.

Table 1. Special-status species that may be affected by Project activities on sites surveyed in 2011

Taxon	Protection Status in the Project Area[1]				
	FWS	BLM Nevada	BLM California	Nevada Department of Wildlife (NDOW)	California Department of Fish and Game (CDFG)
Reptiles					
Desert Tortoise (*Gopherus agassizii*)	Threatened	Sensitive	---	Protected	Threatened
Banded Gila Monster (*Heloderma suspectum cinctum*)	---	Sensitive	Sensitive	Protected	Species of Special Concern
Common Chuckwalla (*Sauromalus ater*)	---	Sensitive	---	---	---
Birds					
Golden Eagle (*Aquila chrysaetos*)	Bird of Conservation Concern	Sensitive	---	Protected	Fully Protected
Western Burrowing Owl (*Athene cunicularia hypugaea*)	Bird of Conservation Concern	Sensitive	Sensitive	Protected	Species of Special Concern
American Peregrine Falcon (*Falco peregrinus anatum*)	Bird of Conservation Concern	Sensitive	---	Protected	Fully Protected
Ferruginous Hawk (*Buteo regalis*)	Bird of Conservation Concern	Sensitive	---	Protected	---
Northern Harrier (*Circus cyaneus*)	---	---	---	---	Species of Special Concern
Swainson's Hawk (*Buteo swainsonii*)	Bird of Conservation Concern	Sensitive	---	Protected	Threatened
Prairie Falcon (*Falco mexicanus*)	Bird of Conservation Concern	Sensitive	---	---	---
Crissal Thrasher (*Toxostoma crissale*)	---	Sensitive	---	Protected	Species of Special Concern
LeConte's Thrasher (*Toxostoma lecontei*)	Bird of Conservation Concern	---	---	---	---
Loggerhead Shrike (*Lanius ludovicianus*)	Bird of Conservation Concern	Sensitive	---	Protected	Species of Special Concern
Western Snowy Plover (*Charadrius alexandrinus nivosus*)	Bird of Conservation Concern	Sensitive	---	Protected	Species of Special Concern
All raptor nests	---	---	---	---	Protected
Mammals					
Desert Bighorn Sheep (*Ovis canadensis nelsoni*)	---	---	Sensitive	Managed game species	Managed game species
Desert Kit Fox (*Vulpes macrotis*)	---	---	---	Protected	Protected
Mountain Lion (*Felis concolor*)	---	---	---	---	Species of Special Concern

1. Sources: BLM (CA) 2010, CDFG California Natural Diveresity Data Base (CNDDB: 2011), NDOW (2007), Nevada Natural Heritage Program (NNHP; 2004, 2010).

4.0 SURVEY RESULTS AND DISCUSSION

Survey results on each site are summarized below; observations are listed in Table 2. Because the surveyed sites are so small and have been previously surveyed and covered in earlier reports, potential impacts to desert tortoises and other special-status species are only briefly summarized. The reader is referred to Karl (2010) for a detailed analysis of Project impacts and conservation recommendations.

Photographs of each site can be viewed in Appendix 2.

Staging Area 1 (McCullough Pass)
This site is in a large, flat area in a boulder and gravel wash that runs through the mountains in McCullough Pass; the elevation is 792 m (2615 ft). Dominant shrubs are desert senna (*Senna armata*) and cheesbush (*Ambrosia salsola*) in the wash, and creosote bush (*Larrea tridentata*) and white burr sage (*Ambrosia dumosa*) in more upland areas. Catclaw acacia (*Senegalia* [=*Acacia*] *greggii*) and big galleta grass (*Pleuraphis rigida*) are occasional in the wash. A dirt access road and the existing 115 kV transmission line pass next to the site.

One older kit fox natal den was observed on the site (Figure 2). Otherwise, there was no tortoise sign, bighorn sheep sign or other special-species sign either on the site or buffer transects. However, in 2008/2009 surveys, several tortoise burrows, scat and a tortoise were found in the immediate area of the site (Karl 2010), so tortoises are known to reside in the site vicinity and may be present on the site at a future date. So, while tortoise presence is established, densities cannot be determined using the FWS 2010 protocol because no tortoises were found on the site.

Bighorn sheep may also be transients on the site as they were observed in the surrounding mountains in 2008. Several other special-status species – chuckwalla, gila monster, burrowing owl, Leconte's thrasher, loggerhead shrike - while not detected during surveys, may inhabit the site based on habitat. Others, such as mountain lion, would be mere transients.

In general, this is a good location for a landing – habitat disturbance from landing should be relatively minimal and will be eliminated by wash flows.

Staging Area 2 (Ivanpah Valley)
This site is on the bajada southwest of the McCullough Mts. It is largely native habitat, although about 10% of the site is on a graded dirt road. Dominant plants are creosote bush and white burr sage, with scattered buckhorn cholla (*Cylindopuntia acanthocarpa*), beavertail cactus (*Opuntia basilaris*) and Indian rice grass (*Achnatherum hymenoides*). Cryptobiotic crusts are well-developed, indicating the long-term undisturbed condition of the site. Soils are soft sandy loams with 30% gravel, mostly fine, in the substrate. The elevation is 915 m (3020 ft).

Table 2. Observations of special-status species during surveys of specific project elements in 2011.

Map (Sign) Number	Subsite	Survey Area	Location (UTM)		Species	Sign Type	Class (Age)[1]	Size	Comments
			Easting	Northing					
01	Construction Yard 7 (Nipton)	400 m ZOI	656220	3925683	Desert Tortoise	Tortoise	-	Carapace length ≈ 220 mm	In open. Minor chips on rear marginals.
02	Construction Yard 7 (Nipton)	400 m ZOI	656220	3925696	Desert Tortoise	Scat	NTY 4	Subadult-Adult	
03	Construction Yard 7 (Nipton)	400 m ZOI	656230	3925680	Desert Tortoise	Scat	TY1	Subadult-Adult	Near Sign 01, probably same tortoise
04	Construction Yard 7 (Nipton)	400 m ZOI	656561	3925582	Desert Tortoise	Tortoise	-	Carapace length ≈ 240 mm	Resting next to shrub, 5 m from burrow
05	Construction Yard 7 (Nipton)	400 m ZOI	656563	3925580	Desert Tortoise	Burrow	1	350 mm wide	Associated with Sign 04
06	Construction Yard 7 (Nipton)	600 m ZOI	655993	3926491	Desert Tortoise	Carcass	1-2 years	Subadult	20% of shell present
07	Staging Area 2	200 m ZOI	659936	3956175	Desert Tortoise	Burrow	5	320 mm wide	In open
08	Staging Area 1	Site Footprint	669372	3959311	Kit Fox	Natal Den	NTY	-	

1. Refer to Appendix 1 for key to age of sign

Anthropogenic disturbances include several dirt roads and two transmission lines in the area. There is also a fenced, denuded area about 200 m (600 ft) northeast that would be suitable as a helipad, if it is available. (On aerial photographs, this looks like a landing strip.) Recreational motorcycle use, including several trails and a race course, are present in the buffer area around the site.

There was no tortoise or other special-species sign on the site or buffers, except one old burrow on one buffer transect. Per the FWS 2010 protocol, then, only tortoise presence can be established, rather than density, because no tortoises were observed. In 2008/2009 surveys, a few burrows were found in the general vicinity of the site (Karl 2010).

While no kit fox natal dens were observed, this is kit fox habitat. Some sensitive bird species (burrowing owl, loggerhead shrikes, LeConte's thrasher) may also nest on and around the site and there may be potential for nesting raptors in the adjacent transmission lines towers.

Construction Yard 2 (Jean)

This site is on the northern edge of town, surrounded on three sides by the freeway onramp, an asphalted truck stop, and the old, paved, two-lane highway to Las Vegas. It is entirely fenced and completely denuded and graveled, except for the northwest portion, which has scattered regrowth of early successional species. There is native creosote bush-white burr sage scrub habitat in the buffer area, but trash and Russian thistle (*Salsola tragus*) are abundant. To the north, the Project vicinity is relatively undisturbed, except for the old highway.

There was no tortoise or other special-status species sign on the site or buffer transects. The low tortoise densities in the immediate Project area and lack of habitat on the site make it highly unlikely for a tortoise to use the site for burrowing. Temporary use of the site for transit is possible, especially if the fence is not tortoise-proof. This is a similar situation for the remainder of the special-status species, except, potentially, burrowing owls, which may take refuge in ground squirrel or other burrows on the site.

Construction Yard 3 (East of Primm)

This site is highly disturbed and mostly graveled. It is bordered on the east by the railroad and bisected by a road to an existing power plant just east of the railroad. There is one structure, possibly a well. South of the bridge, the site is a highly disturbed and graded debris storage area. About 10% of the site is relict creosote bush-white burr sage habitat and there is native habitat in the buffer area; the native scrub is relatively intact south of the site on the east side of the railroad. Elsewhere, however, it is moderately to highly disturbed. A fenced water treatment facility is southeast of the site. A motorcycle race track weaves through the buffer and there are several, only partially intact tortoise exclusion fences for the power plant. The habitat is increasingly disturbed west of the site. The elevation is about 812 m (2650 ft).

There was no tortoise or other special-species sign. In 2008 and 2009 surveys, tortoise sign was observed in the site vicinity, so tortoises could be present on the site in the future and may construct burrows, both under debris and in the remaining native habitat.

Few other species are expected, although burrowing owls and kit foxes could enter the site and construct or inhabit reproductive shelters there. There is a slight chance for nesting birds in the relict habitat.

Of note is that many birds were observed at the water treatment ponds, so special-status migrants that would otherwise be absent from the area might be present there due to the water feature. The water treatment facility is outside the Project site, however, so any birds at the facility would not be affected by equipment laydown on the Project site.

Construction Yard 4 (Primm)

This site is completely denuded and fenced. It borders the Primm outlet mall along the northwest and the rest of the border is a barren, fenced, flood control structure that extends for some distance from the site. Windblown trash and an off-highway-vehicle (OHV) racetrack is also a feature of the area and I-15 is only about 500 m (0.3 mi) west. There is native, albeit disturbed, habitat beyond the flood control structure that is largely dominated by creosote bush and white burr sage. The dominant shrubs become allscale (*Atriplex polycarpa*) as the outer buffer transects near the playa (Ivanpah Dry Lake), which lies about 400 m (1300 ft) southwest of the site.

No tortoise or other special-species sign was observed on the site or buffer transects, consistent with previous years' surveys. The low tortoise densities in the immediate Project area and lack of habitat on the site make it highly unlikely for a tortoise to use the site for burrowing. Temporary use of the site by tortoises and other special species for transit is possible. Burrowing by burrowing owls is possible, but not expected.

Construction Yard 5 (Primm)

This site is a gravel lot next to the west side of the fenced Primm casino and parking lot. There are a couple of very small patches of disturbed vegetation (inkweed [*Suaeda moquinii*]) on the site and Ivanpah Dry Lake nearly abuts the site's southern border. Topography is mixed in the buffer transects, ranging from the playa in the south to low mountains west and north. In addition to the Primm casino and hotel, there is a set of water tanks and a quarry north of the site.

No tortoise sign was observed in 2011. In 2008 and 2009, both scat and a burrow were observed in the mountains west of the site. So, tortoises could be present on the site in the future, mostly as transients. They may construct burrows, although this is unlikely due to the very poor quality of the relict habitat patches.

Few other species are expected, although burrowing owls and kit foxes could enter the site and construct or inhabit reproductive shelters there. There is a little chance for nesting birds in the relict habitat. An unidentified falcon, possibly a peregrine falcon, was observed flying overhead, but nesting would not occur on the Project site.

Construction Yard 7 (Nipton)

This site is part of a larger, previously graded area bordered by Nipton Road and the Union Pacific Railroad on two sides. It is surrounded on these same two sides by the town of Nipton. There is substantial early regrowth of white burr sage and creosote bush, with cheesebush, jimson weed (*Datura wrightii*) and coyote gourd (*Cucurbita palmata*). A small wash travels through the site. The surrounding area beyond the immediate, graded pad and the town is a lightly diverse, native creosote bush-white burr sage scrub, with silver cholla (*Cylindropuntia echinocarpa*), pencil cholla (*C. ramossissima*), hedgehog cactus (*Echinocactus polycephalus*) and paperbag bush (*Salazaria mexicana*). This is the lower part of the bajada in Ivanpah Valley, at an elevation of 908 m (2998 ft).

There was no sign of special-status species on the site. In the buffer, however, there were two tortoises, with an associated scat and burrow, and another scat on the 400 m buffer transect, south of the site. The only other sign was on the 600 m ZOI at the northwest turn, where there was a one- to two-year-old carcass fragment. In 2008/2009 surveys, numerous burrows and several scat and carcass parts were observed in the vicinity of this site, although none was seen on or adjacent to the site. Per the FWS 2010 protocol, only presence can be established, rather than density, because no tortoises were observed onsite although they and their sign were observed in the immediate vicinity. Based on these multi-year observations, tortoises are present in the area and may re-enter the site, even constructing burrows on the site.

While no kit fox natal dens or burrowing owls were observed, this is habitat for both species. There is also a slight chance for nesting birds in the relict habitat.

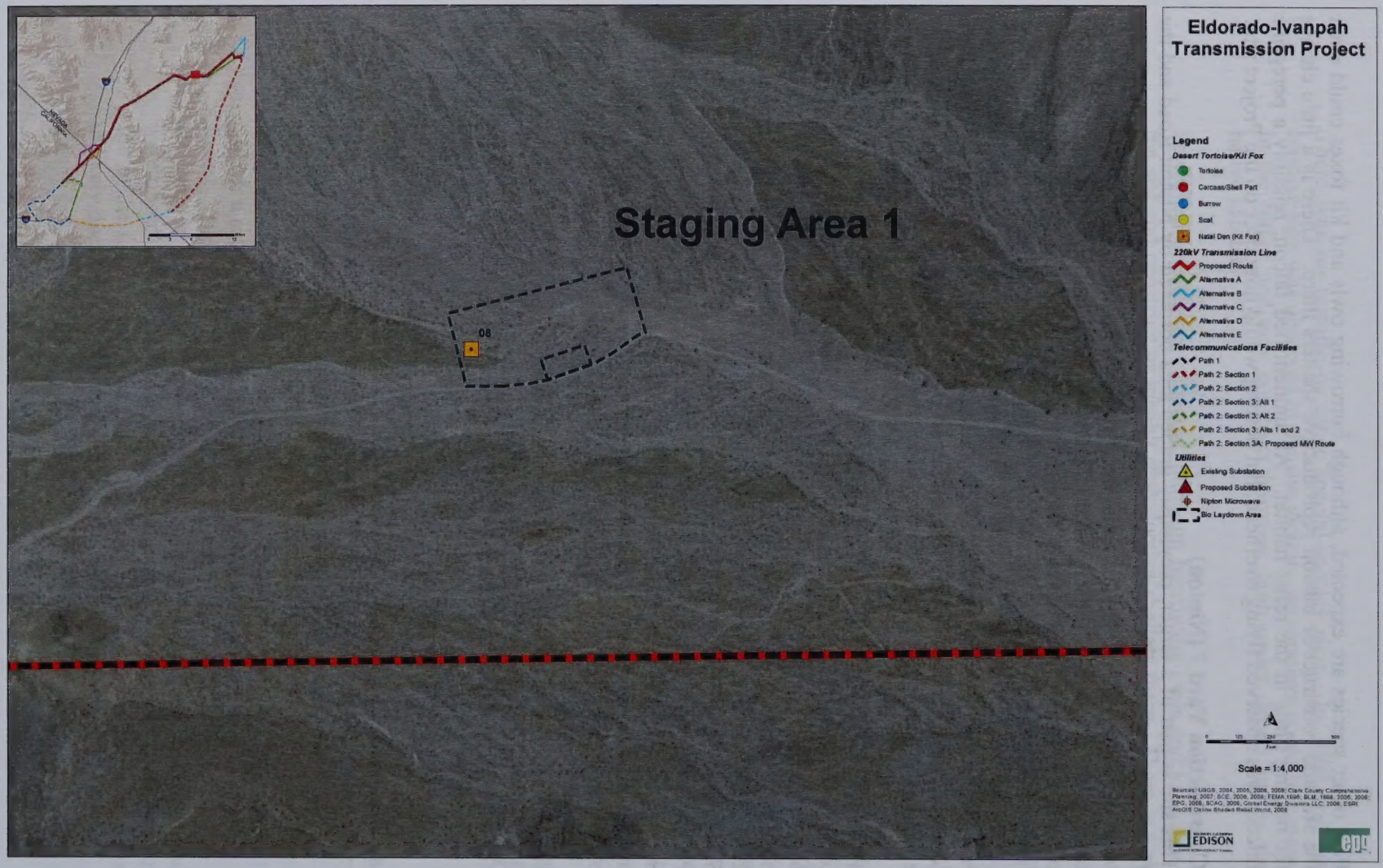

FIGURE 2. Desert tortoise and other special-status species sign observed in 2011 associated with Staging Area 1. Number next to sign corresponds to Map Number in Table 2.

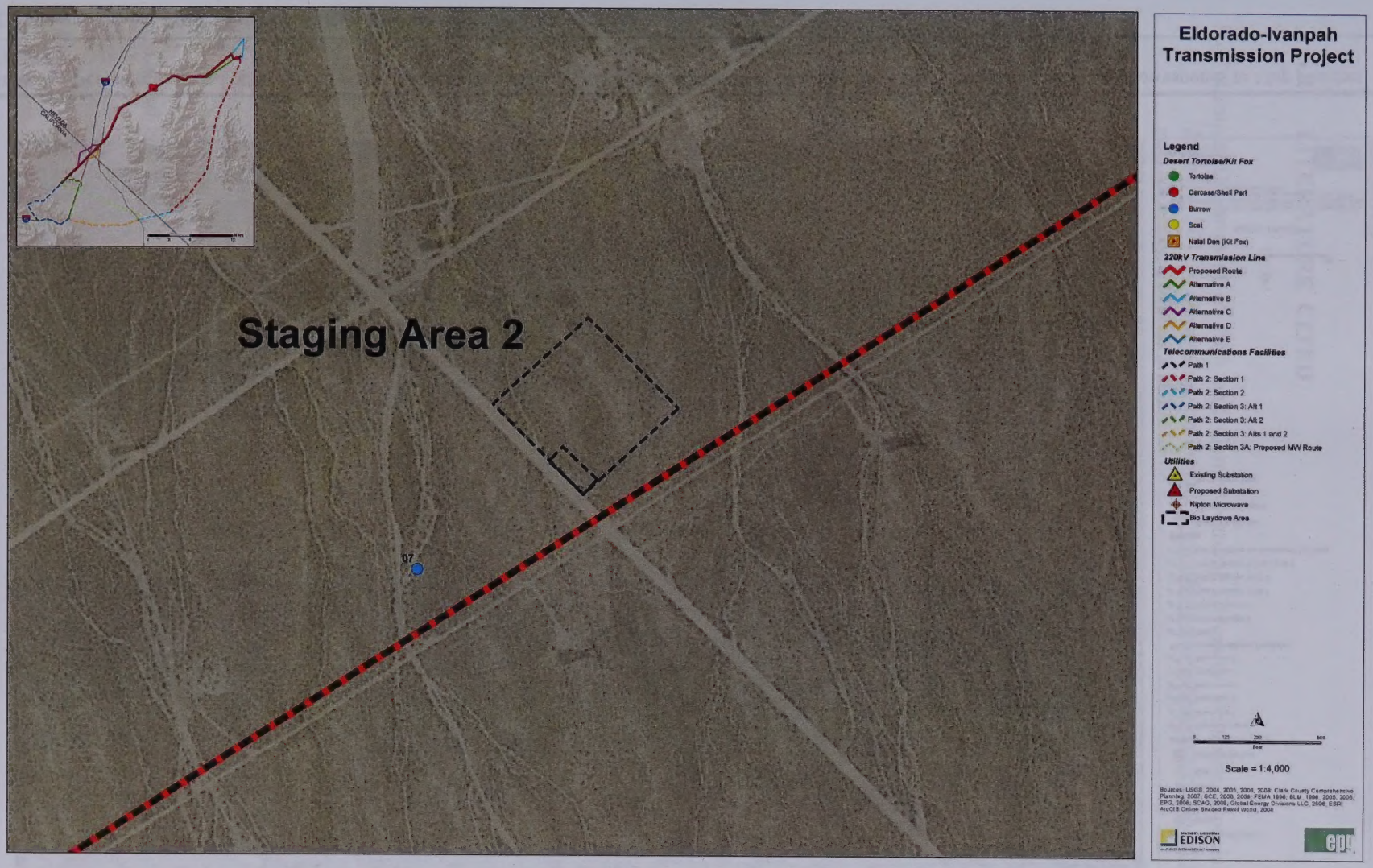

FIGURE 3. Desert tortoise and other special-status species sign observed in 2011 associated with Staging Area 2. Number next to sign corresponds to Map Number in Table 2.

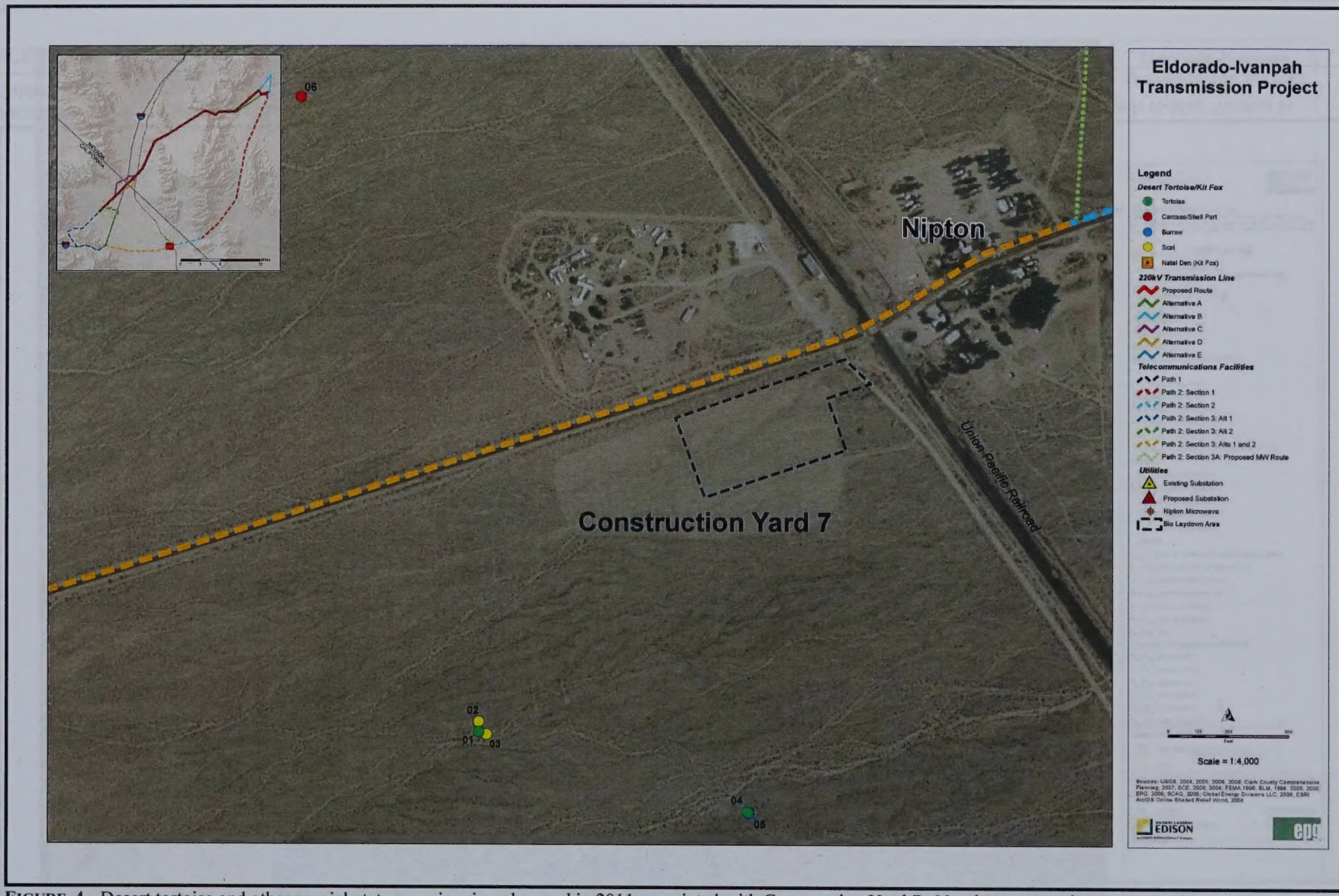

FIGURE 4. Desert tortoise and other special-status species sign observed in 2011 associated with Construction Yard 7. Number next to sign corresponds to Map Number in Table 2.

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APPENDIX 1

Sample Desert Tortoise and Special-Status Species Data Form and Key for the Eldorado-Ivanpah 2011 Surveys

Appendix 2. Sample Desert Tortoise and Special-Status Species Form, Front Side

STAGING AREA - 2

PROJECT ELDORADO-IVANPAH TRANSMISSION PROJECT Page /
2011 SPECIAL-STATUS SPECIES SURVEYS

DATE 18 MAY 2011
TIME: Start 06:05
End 10:40
WEATHER:

	Ta	5CM	Tg	Cloud Cover	Wind
Start	15.5	16	22	60% mixed	12-15
End	16	16.5	25	40% mixed	7-10

SURVEYORS: P. FRANK
PROJECT ELEMENT
STAGING AREA -2
ZOI

STARTING UTM 06 60 017 E 39 56 372 N
ENDING UTM 06 60 131 E 39 86 267 N
(NAD 83)
(or diagram below)
TRANSECT WIDTH 10 m
TRANSECT LENGTH (17) 170 m

GENERAL SITE DESCRIPTION:
VEGETATION SHRUB LAYER AND BUNCH GRASSES)

Aspect Dominants LARTRI-AMBTOM

Common Species CLYACA

Occasional Species OPUBAS, ACIHYM

% Cover 16%
Avg. Height of Dominant Shrub Species 1.3, 0.3

UNDERSTORY
Abundant Species SCHSP, CHIFAE, — Biological soil crust abundant ≈ 10% cover see Photo B & C

Exotics (Map concentrations and describe here relative to population size and geographic breadth.) SCHSP.

TOPOGRAPHY
Landform BAJADA

Drainage Type Sm Runnels & Percolation

Elevation (state meters or feet) 3020 ft

SUBSTRATE
Color Fines Tan w/a bit of ocasy CP - granitic white area & pink
Coarse Particles (Type, % Cover) Boulder 5% Cobble 10%, Ceramic 10% F. gravel 20%
Soil Texture and Consistence Sandy loam w gravel - soft

PRESENCE OF PREDATORS: Ravens - # Detected Ø **# Nests**
Coyotes - # Detected **Scat?** Ø **Scat Piles**

HUMAN-RELATED DISTURBANCES (Onsite and Adjacent) — Lg dirt Rd 15% of area, Motorcycle trail & tracks Sm amount of trash

SITE PICTURE: Photographer FRANK
A - Form ☐
(Describe site pictures) A & F → FORM
A –
B – B, C, D & E see map for details

163m 39°

Reverse Side of Data Form

Staging Area 2
200 ND 201

Map Sign

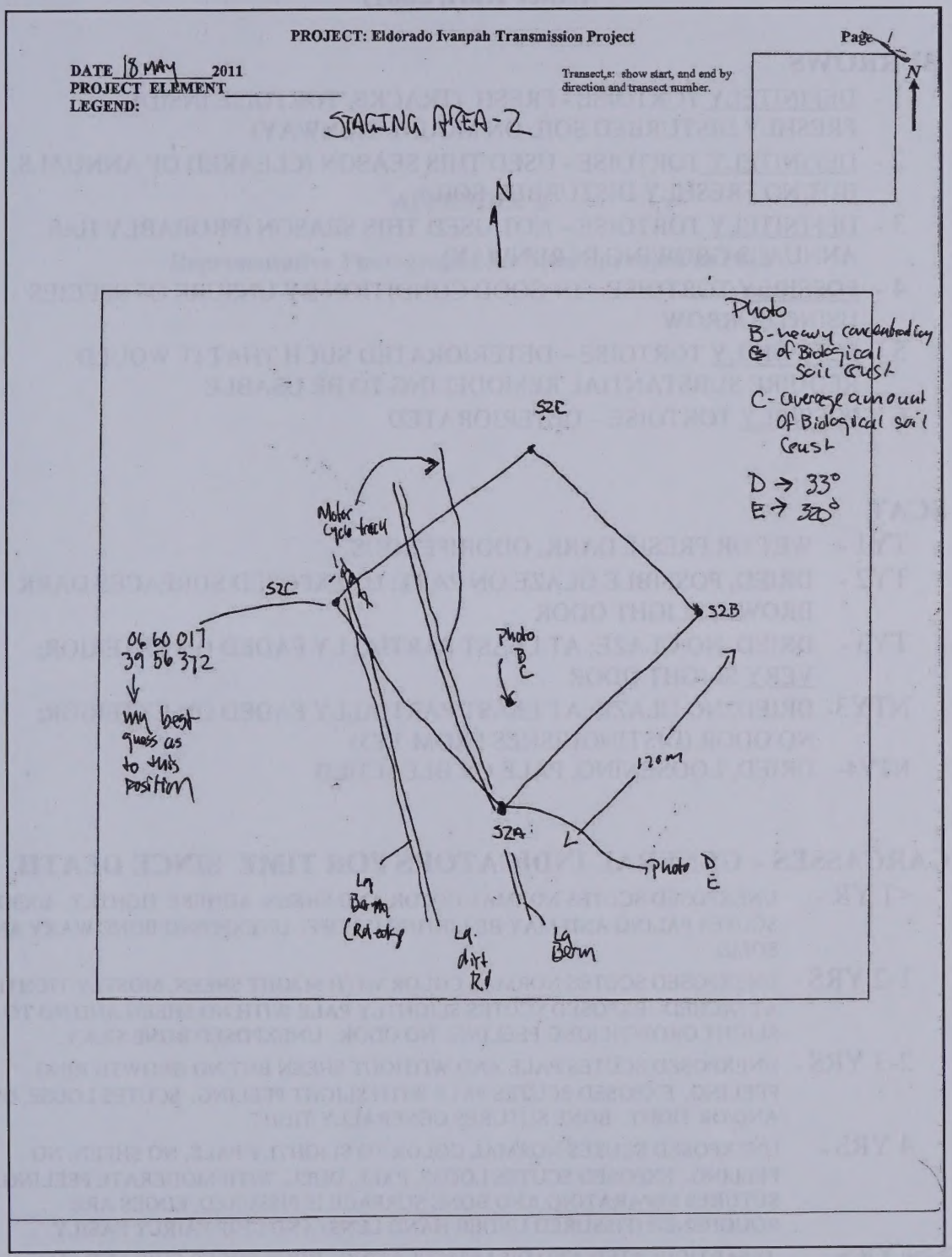
Show: Direction of Travel Origin

N

Sign #	Waypoint I.D.	UTM (NAD 83)	DESERT TORTOISE Sign Type	Class	Size Width (sc, bur, tr) MCL (shell, tort)	Burrow Location	In/Out Burrow? Visible?	Live Tortoise Evidence of Disease?	Photo (check)
1	ES272 TB1PF	0659936 3956175	BURROW	B	326	OPEN			

Sign #	Waypoint I.D.	UTM (NAD 83)	OTHER SPECIES Species	Sign Type	Sign Condition	Ungulate Scat Collected (Check)	Comments

Data Form Map



KEY TO SIGN CLASSES
(Alice Karl, 2001)

BURROWS

1 - DEFINITELY TORTOISE - FRESH (TRACKS, TORTOISE INSIDE, FRESHLY DISTURBED SOIL ON MOUND/RUNWAY)

2 - DEFINITELY TORTOISE - USED THIS SEASON (CLEARED OF ANNUALS, BUT NO FRESHLY DISTURBED SOIL)

3 - DEFINITELY TORTOISE – NOT USED THIS SEASON (PROBABLY HAS ANNUALS GROWING IN RUNWAY)

4 - POSSIBLY TORTOISE – IN GOOD CONDITION BY UNSURE OF SPECIES USING BURROW

5 - DEFINITELY TORTOISE – DETERIORATED SUCH THAT IT WOULD REQUIRE SUBSTANTIAL REMODELING TO BE USABLE

6 - POSSIBLY TORTOISE – DETERIORATED

SCAT

TY1 - WET OR FRESH, DARK, ODORIFEROUS

TY2 - DRIED, POSSIBLE GLAZE ON PART; UNEXPOSED SURFACES DARK BROWN; SLIGHT ODOR

TY3 - DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; VERY SLIGHT ODOR

NTY3- DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; NO ODOR (DISTINGUISHES FROM TY3)

NTY4- DRIED, LOOSENING, PALE OR BLEACHED

CARCASSES – GENERAL INDICATORS FOR TIME SINCE DEATH

<1 YR - UNEXPOSED SCUTES NORMAL COLOR AND SHEEN, ADHERE TIGHTLY. EXPOSED SCUTES PALING AND MAY BE LIFTING OR OFF. UNEXPOSED BONE WAXY AND SOLID.

1-2 YRS - UNEXPOSED SCUTES NORMAL COLOR WITH SLIGHT SHEEN, MOSTLY TIGHTLY ATTACHED. EXPOSED SCUTES SLIGHTLY PALE WITH NO SHEEN AND NO TO SLIGHT GROWTH RING PEELING. NO ODOR. UNEXPOSED BONE SILKY.

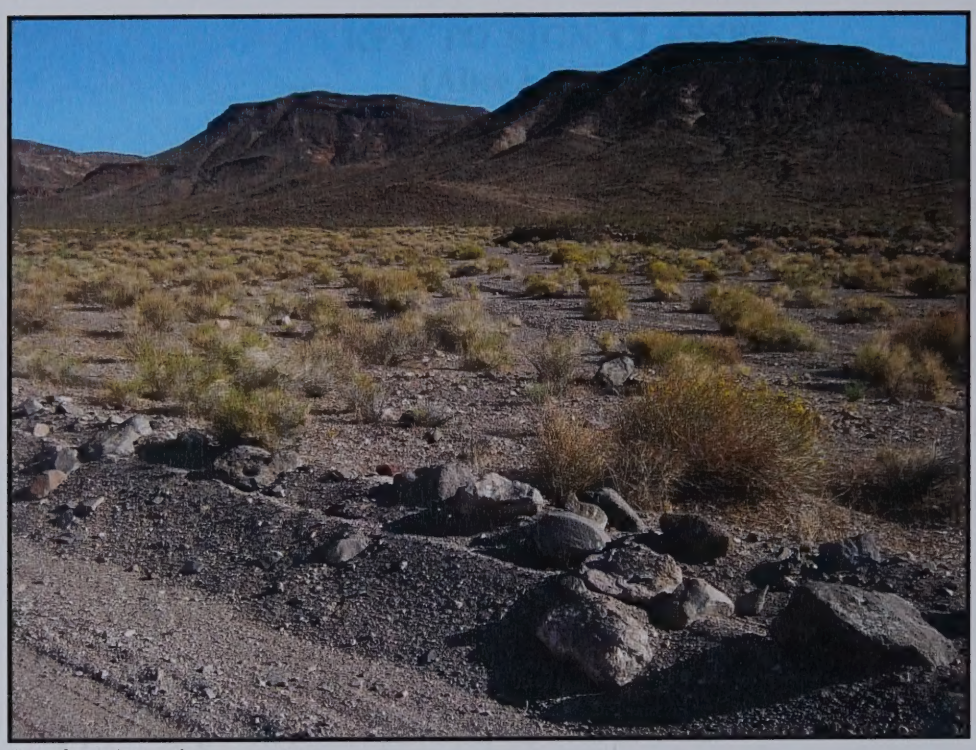
2-3 YRS - UNEXPOSED SCUTES PALE AND WITHOUT SHEEN BUT NO GROWTH RING PEELING. EXPOSED SCUTES PALE WITH SLIGHT PEELING. SCUTES LOOSE, OFF AND/OR TIGHT. BONE SUTURES GENERALLY TIGHT.

4 YRS - UNEXPOSED SCUTES NORMAL COLOR TO SLIGHTLY PALE, NO SHEEN, NO PEELING. EXPOSED SCUTES LOOSE, PALE, DULL, WITH MODERATE PEELING. SUTURES SEPARATING AND BONE SURFACE IS FISSURED, EDGES ARE ROUGHENED (FISSURED UNDER HAND LENS) AND CHIP FAIRLY EASILY

>>4 YRS- DISARTICULATED AND DISARTICULATING. BONE EDGES CHIP AND MAY CRUMBLE EASILY. SCUTES ARE PEELING AND CURLED

APPENDIX 2

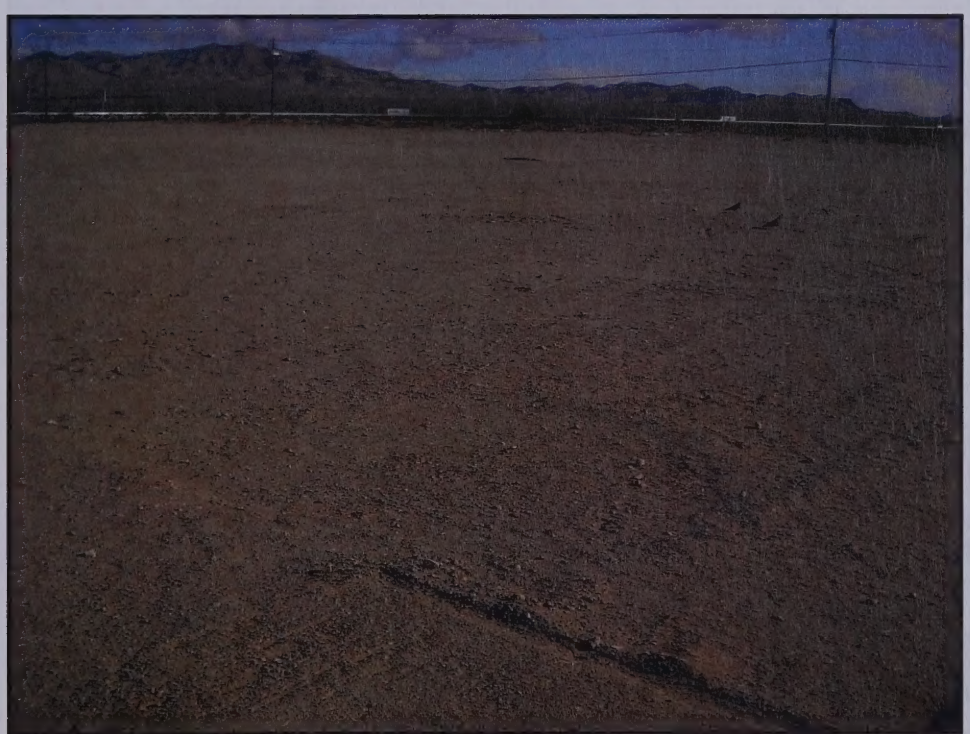
Representative Photographs for Sites Surveyed in 2011



Staging Area 1.

Non-mountainous habitat around Staging Area 1.

Staging Area 2.



Construction Yard 2 (Jean).

Construction Yard 3 (east of Primm), facing southwest from the bridge through the site's center.

Construction Yard 3, facing northeast from the bridgethrough the center.

Construction Yard 4 (Primm) facing southeast.

Site condition of Construction Yard 5. (This is actually a photograph of Construction Yard 4, but the habitat is identical to Construction Yard 5.)

Construction Yard 5 (Primm) facing northwest into native habitat from western site edge.

Construction Yard 7 (Nipton).

Eldorado-Ivanpah Transmission Project

Burrowing Owl Survey

WESTERN BURROWING OWL SURVEY
ELDORADO TO IVANPAH TRANSMISSION PROJECT
CALIFORNIA SEGMENT

Prepared for
Southern California Edison

Prepared by
EPG, Inc.

July 2011

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INTRODUCTION

The Western Burrowing Owl (*Athene cunicularia hypugaea*) is a California Department of Fish and Game (CDFG) species of special concern, a Bureau of Land Management (BLM) sensitive species, a United States Fish and Wildlife Service bird species of conservation concern, and is protected under the Migratory Bird Treaty Act (CDFG 2011). The BLM requested that Southern California Edison Company (SCE) conduct surveys for the Western Burrowing Owl on the California segment of the Eldorado to Ivanpah Transmission Line Project (EITP). EPG, Inc. was contracted to conduct the surveys, which were performed in accordance with the current CDFG-recognized Burrowing Owl Survey Protocol and Mitigation Guidelines (California Burrowing Owl Consortium 1993).

Widespread declines in the range and abundance of Burrowing Owls have been attributed to habitat loss and fragmentation, and to control and extermination of colonial burrowing mammals with which they are commonly associated (Hjertaas et al. 1995; Dechant et al. 2003). Potential nesting habitat for Burrowing Owls has also been reduced through conversion of land to agricultural and urban uses (Hjertaas et al. 1995). However, some agriculture areas have become important habitats for the species. In addition to removing potential nest sites, habitat fragmentation may increase the density of predators such as foxes and Coyotes (*Canis latrans*), and make it more difficult for unpaired Burrowing Owls to find mates (Sheffield 1997). Increased urbanization may result in an increase in predation by domestic dogs and cats. Pesticides may harm Burrowing Owls through direct toxicity, secondary toxicity from ingesting poisoned prey, and reduction in the abundance of prey (Dechant et al. 2003).

SCE is planning to construct the EITP for the purpose of providing the electrical facilities necessary to transmit up to 1,400 megawatts of new solar generation in the Ivanpah Dry Lake area. The project consists of the construction of a 35-mile long, double-circuit, 220-kilovolt (kV) transmission line between the existing Eldorado Substation east of the McCullough Mountains and the new 220/115 kV Ivanpah Substation west of the Ivanpah Lake playa.

Ground-disturbing project activities that could potentially affect Burrowing Owls present in the California segment of the project will primarily occur between the west edge of the Ivanpah Lake playa, and the Ivanpah Substation site. The transmission line will not be rebuilt west of the substation. However, minor ground-disturbing activities may occur at structure locations on an additional ¾-mile segment of the existing line, west of the Ivanpah Substation site, where SCE will modify transmission structures to receive a fiber-optic telecommunication line (also included in the survey). The EITP transmission line right-of-way is 200 feet wide. An auxiliary fiber-optic telecommunications line will be placed on the existing Eldorado to Lugo transmission line in Nevada, between the Eldorado Substation and Nipton Road (State Highway 164). The fiber-optic line will be buried west of this point north of the Nipton Road to the town of Nipton, and then north to the Nipton microwave site, a total linear distance of approximately 3.2 miles within the California segment of the project. The EITP buried fiber-optic line right-of-way is 50 feet wide.

The EITP alignment traverses the BrightSource Energy Ivanpah Solar Electric Generating System (ISEGS). Current development of the solar fields and Ivanpah Substation site involves the presence of large numbers of construction workers, heavy equipment, and construction

traffic. The Western Burrowing Owl was detected on the ISEGS site in 2008 (BLM 2010), so presence of the birds in the vicinity is known. Burrowing Owls that may have been present within the ISEGS construction footprint prior to initiation of construction may have moved into adjacent habitat.

METHODS

The California Burrowing Owl Consortium survey protocol is a four-phased approach to documenting and mitigating for Burrowing Owls that occur in areas that are to be disturbed by development. The Phase I survey assesses presence of suitable Burrowing Owl habitat, and includes a 500-foot buffer around project limits. Documentation of Burrowing Owl habitat on the site requires a follow-up pedestrian survey for burrows that could be used by Burrowing Owls (Phase II survey). The Phase II burrow survey requires 100-percent coverage of the project area and buffer. Survey transects must be spaced to provide 100-percent visual coverage, and must be centered no more than 100 feet apart. Presence of Burrowing Owls or suitable burrows documented during the Phase II survey requires a subsequent Burrowing Owl survey, census, and mapping of burrows (Phase III survey). Phase III consists of a breeding season survey (February 1 through August 31) and if no owls are detected, a winter survey (December 1 through January 31). Summer and winter surveys are each comprised of four visits on four separate days for each potentially suitable burrow. Phase IV is the resource summary and report prepared for the CDFG.

The Phase I Burrowing Owl survey was conducted by two EPG biologists on the California segment of the EITP on March 22, 2011, between 7:30 and 10:00 a.m. Weather conditions were mostly clear in the valley with good visibility and isolated showers in the adjacent mountains. The high temperature for the day was 60 degrees Fahrenheit and winds were less than 5 miles per hour. The Phase I survey was conducted by driving on existing access roads along project alignments for the California portions of the project. The surveyors periodically exited the vehicle and walked in the adjacent desert to look for burrows, and to assess vegetation composition, height, and density, as it related to Burrowing Owl habitat.

SURVEY RESULTS

Phase I: Habitat Assessment

Suitable Burrowing Owl habitat typically consists of areas with short, sparse vegetation on level or low-gradient substrates that support colonial burrowing mammals. These mammals provide burrows that are modified by the owls for their own use. In areas that lack colonial burrowing mammals, Burrowing Owls will use excavations made by other mammals, such as Badger (*Taxidea taxus*), skunks, foxes, Coyote (*Canis latrans*), and unoccupied Desert Tortoise (*Gopherus agassizii*) burrows. They can be common in agricultural areas, where they may live along irrigation canals or in fallow fields, and occur near human developments including airports and golf courses (Terres 1980; Ehrlich et al. 1988; Dechant et al. 2003).

Suitable habitat for Burrowing Owls is present along the existing transmission line, from the west edge of the Ivanpah Lake playa, west to a point approximately 7 miles west of the playa—

after which the terrain becomes too steep, the ground too rocky, and the vegetation too dense to support Burrowing Owls.

Vegetation on the project right-of-way is dominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*), and includes several species of cacti, Mojave yucca (*Yucca schidigera*) (Photographs 1 and 2; Appendix A) and a variety of shrub and forb species (Appendix B). Vegetation in the project area is generally short, and areas containing open patches of relatively bare ground that would be attractive to Burrowing Owls are interspersed throughout the project area (Photographs 1, 4, and 5). Along the transmission line right-of-way the substrate is generally rockier to the west (Photographs 1 and 2), but the size and percentage of rocks in the soil decreases from west to east (Photographs 4 and 5). Vegetation at higher elevations along the project routes is denser, but still contains areas that are open enough to support Burrowing Owls. Burrows observed during the Phase I survey consisted mostly of small rodent holes.

Wildlife observed during the Phase I survey was limited to a few bird species, including Red-tailed Hawk (*Buteo jamaicensis*), Swainson's Hawk (*Buteo swainsoni*), American Kestrel (*Falco sparverius*), Northern Flicker (*Colaptes auratus*), Common Raven (*Corvus corax*), and Sage Thrasher (*Oreoscoptes montanus*).

The buried segment of the telecommunications line between the California/Nevada state line and the Nipton microwave site north of Nipton, California, and two small ancillary project areas (the Nipton microwave and the Nipton construction yard sites), both located at Nipton, California, were not visited during the Phase I survey. Based on conditions observed on the main transmission line route and a comparison with aerial photographs of the buried cable route and ancillary sites, we determined suitable Burrowing Owl habitat was likely to be present in these areas in their entirety. Presence of suitable Burrowing Owl habitat within the project limits required that a Phase II burrow survey be conducted for the project.

Phase II: Burrow Survey

Phase II burrow surveys were conducted by two EPG biologists between April 25 and April 28, and June 23 and June 25, 2011. Surveys were conducted between 6:00 a.m. and 4:30 p.m. Surveys covered approximately 700 acres on the main transmission line right-of-way, including the 500-foot required buffer (Figure 1). Surveys conducted along the Nipton telecommunications route covered approximately 375 acres (Figure 1). The survey areas for the Nipton microwave site and the Nipton construction yard were approximately 22 and 30 acres, respectively (Figure 1). The total surveyed area was approximately 1,127 acres. Because of average vegetation density and visibility limitations inherent in the terrain, transect separation was established at 80 feet for all project elements.

Surveys were conducted by walking parallel transects along the long dimension of most project segments. Transects at the Nipton construction yard and the Nipton microwave site were in a north-to-south orientation. Each surveyor used a handheld Trimble GeoExplorer 2008 Series GPS unit programmed with project data and survey transects. Data points and field notes for burrows were entered directly into the GPS units. Each potentially suitable burrow was

temporarily marked with ribbon flagging to facilitate visually relocating burrows during subsequent Phase III surveys. This improves potential for spotting live birds when approaching burrows. Photographs of burrow sites are included in Appendix A of this report.

Weather conditions varied during the 7 days of the surveys. April 25 was clear and mild to warm during the day with intermittent light breezes. April 26 and 27 were similar except that winds were relatively strong (averaging 5 to 7 miles per hour, and gusting up to 13 miles per hour). The air temperature continued to increase slightly each day. April 28 was calm in the morning but very strong winds developed by late afternoon (gusts to 25 miles per hour). Visibility was good during all surveys except the late afternoon of the 28th on the east side of the playa when strong winds lifted soil from the playa into the air, reducing visibility and making walking of transects difficult (Photograph 6). We feel that the effectiveness of the survey in this area was not compromised by these conditions. Weather was clear during the June surveys, with morning temperatures between 74 and 85 degrees Fahrenheit. Daily high temperatures reached 100 to 106 degrees Fahrenheit. Evening survey temperatures ranged between 95 and 102 degrees Fahrenheit. There were light breezes some mornings, but winds did not exceed 12 mph at anytime during surveys. No precipitation was recorded in the area during the survey period. Visibility was good during the entire survey period.

Occupied residential and commercial lands are present within the 500-foot buffer of the Nipton construction yard site (Figure 2c). East of the railroad tracks is the Nipton store and bed-and–breakfast, along with several residences. This area is fully developed, contains no suitable habitat for Burrowing Owls, and was not surveyed. There are additional residences north of Highway 164 and there is no suitable habitat among the residential tracts; but, between the residences and the highway, there is some disturbed land that contains large soil piles (Photograph 10). We did survey this narrow strip of land and found no burrows suitable for Burrowing Owl use.

No permanent fresh water is available within 1 mile of any of the surveyed project segments. Wildlife species documented during the Phase II surveys are listed in Appendix C. No Burrowing Owls or sign attributable to them were observed during the Phase II surveys, but suitable habitat with burrows is present. Table 1 contains burrow data from the Phase II surveys.

Table 1. Burrowing Owl Survey Burrow Data

Location	Burrow Type(s)	UTM NAD 83 Location		Notes	Reference Photo(s)	Date
		Easting	Northing			
1	Badger	639056	3934205	Active Badger burrow; fresh digging	11	4-25-2011
2	Undetermined	638590	3934162	No recent use	12	4-25-2011
3	Tortoise	638618	3934219	—	13	4-25-2011
4	Undetermined	639636	3935196	Possible tortoise; no recent use	—	4-26-2011
5	Fox	639849	3935220	No recent use	—	4-26-2011
6	Fox	639841	3935218	Active fox burrow; tracks	14	4-26-2011
7	Coyote	640291	3935695	No recent use	15	4-26-2011
8	Coyote	640259	3935515	No recent use; old scat	—	4-26-2011
9	Tortoise	640667	3935930	No recent use	16	4-26-2011

Table 1. Burrowing Owl Survey Burrow Data						
Location	Burrow Type(s)	UTM NAD 83 Location		Notes	Reference Photo(s)	Date
		Easting	Northing			
10	Undetermined	640701	3935972	No recent use	17	4-26-2011
11	Coyote	640715	3935972	Active Coyote burrow; 2 burrows within 10 feet of each other	18	4-26-2011
12	Tortoise	640945	3936211	No recent use; a few other smaller burrows nearby	19	4-26-2011
13	Undetermined	640956	3936229	No recent use	20	4-26-2011
14	Undetermined	640791	3936334	No recent use	21	4-26-2011
15	Undetermined	641277	3936899	No recent use	22	4-27-2011
16	Undetermined	641407	3936801	—	23	4-27-2011
17	Undetermined	641499	3936894	No recent use	24	4-27-2011
18	Tortoise	641592	3936995	—	25	4-27-2011
19	Coyote	641555	3936817	No recent use	26	4-27-2011
20	Undetermined	642215	3937466	No recent use	27	4-27-2011
21	Undetermined	642116	3937375	No recent use	28	4-27-2011
22	Coyote	642130	3937454	—	29	4-27-2011
23	Undetermined	641774	3937161	No recent use	30	4-27-2011
24	Undetermined	641726	3937111	—	—	4-27-2011
25	Tortoise and rodent	641714	3937182	2 burrows; rodent/tortoise	31	4-27-2011
26	Tortoise	641887	3937353	No recent use	—	4-27-2011
27	Tortoise	641930	3937526	2 burrows; tortoise and undetermined; no recent use of either	32	4-27-2011
28	Tortoise	642013	3937631	—	33	4-27-2011
29	Undetermined	642184	3937653	No recent use	34	4-27-2011
30	Tortoise	642774	3937957	No recent use	35	4-27-2011
31	Tortoise	643027	3938194	No recent use	36	4-27-2011
32	Tortoise	643030	3938203	No recent use	—	4-27-2011
33	Undetermined	642633	3937954	—	37	4-27-2011
34	Undetermined	642664	3937984	2 burrows	38	4-27-2011
35	Undetermined	643006	3938393	—	39	4-27-2011
36	Tortoise	642896	3938432	No recent use	40	4-28-2011
37	Tortoise	642418	3938028	No recent use	41	4-28-2011
38	Tortoise	642291	3937895	No recent use	—	4-28-2011
39	Rodent	656363	3926048	No recent use	42	4-28-2011
40	Rodent	645807	3941199	Multi-burrow complex	43 & 44	4-28-2011
41	Undetermined	639392	3934701	2 burrows; possible canid scat	45	4-25-2011
42	Badger	639817	3934986	Partially filled; surrounded by creosote bushes; unlikely site but possible; no recent use	46	4-26-2011
43	Undetermined	640082	3935715	No recent use	47 & 48	4-26-2011

Table 1. Burrowing Owl Survey Burrow Data						
Location	Burrow Type(s)	UTM NAD 83 Location		Notes	Reference Photo(s)	Date
		Easting	Northing			
44	Tortoise	640329	3935628	Good potential site; occupied by White-tailed Antelope Squirrel	49 & 50	4-26-2011
45	Coyote	640853	3936286	Active Coyote burrow; no Burrowing Owl sign	51 & 52	4-26-2011
46	Coyote	641685	3936896	Old burrow; no sign	53 & 54	4-27-2011
47	Tortoise	642247	3937403	Small tortoise burrow; no recent use	55 & 56	4-27-2011
48	Coyote	641797	3937085	No recent use; no sign	57 & 58	4-27-2011
49	Tortoise and rodent complex	642081	3937663	Possible old Burrowing Owl hole; one very old whitewash; no recent use	59 & 60	4-27-2011
50	Tortoise	642014	3937630	Small, old tortoise burrow; canid scats; no recent use	61 & 62	4-27-2011
51	Fox and tortoise	641633	3937274	3 closed holes; fox and tortoise; coyote scats; no recent use	63 & 64	4-27-2011
52	Tortoise	643045	3938275	Closed; no recent use	65 & 66	4-27-2011
53	Tortoise	657012	3927232	Active tortoise burrow	67 & 68	4-28-2011
54	Rodent	656389	3926050	Multi-burrow complex; 3 tennis-ball-size openings	69 & 70	4-28-2011
55	Tortoise	660038	3927198	Open burrow	71	6-23-2011
56	Tortoise	660483	3927019	Open burrow	72	6-23-2011
57	Badger	659721	3926832	Active	73	6-23-2011
58	Undetermined	659468	3926797	No recent use	74	6-23-2011
59	Tortoise	658492	3926605	No recent use	75	6-24-2011
60	Badger	658545	3926745	Animal tracks; recent use	76 & 77	6-24-2011
61	Tortoise	657106	3926782	Live tortoise outside burrow	78	6-25-2011
62	Tortoise	656988	3926952	No recent use	79 & 80	6-25-2011
63	Tortoise	656901	3926815	Animal tracks; recent use	81	6-25-2011

Phase III: Burrowing Owl Surveys, Census and Mapping

Since suitable potential burrows were located in the Phase II survey, a Phase III Burrowing Owl nesting season survey was performed between June 25 and June 30, 2011. Phase III surveys were conducted during the peak of the breeding season (April 15 through July 15). Phase III surveys were conducted mostly during consecutive days during the survey effort. Surveys were conducted as either a morning or an evening survey. Morning surveys were performed between 1 hour prior to sunrise until 2 hours after sunrise, and evening surveys were performed between 2 hours prior to sunset until 1 hour after sunset. By dividing the project into eastern and western sections, all burrows could be adequately surveyed daily within the allowable time constraints without affecting the quality of the survey effort. Survey dates for project segments for the four individual Phase III surveys are given in Appendix D.

Surveys were conducted by quietly approaching each previously marked burrow, looking for activity of Burrowing Owls and other wildlife. Burrow entrances were examined for wildlife sign including evidence of disturbed ground in the burrow threshold and on the spoils mound (if present).

Results

No Burrowing Owls or their sign were observed at any of the 63 potentially suitable burrows or burrow complexes during either the Phase II or Phase III surveys or anywhere on the project site at any time. There are no CDFG records for Burrowing Owls in the project vicinity. Burrowing Owls were documented in the vicinity of the western portion of the project area in 2008 within the ISEGS development area (BLM 2008). The ISEGS is a very large project, and the exact location or potential proximity of those owl sightings to the EITP is unknown. The ISEGS final EIS stated that birds were observed, but no burrows or other sign of the birds were documented. It is possible that the observed animals represented transient individuals. Considering the extensive Desert Tortoise and other biological surveys that have been conducted on the EITP project over the last several years, with no detection of Burrowing Owls, we conclude that their potential for presence in the project portions of the Ivanpah Valley in California is very limited.

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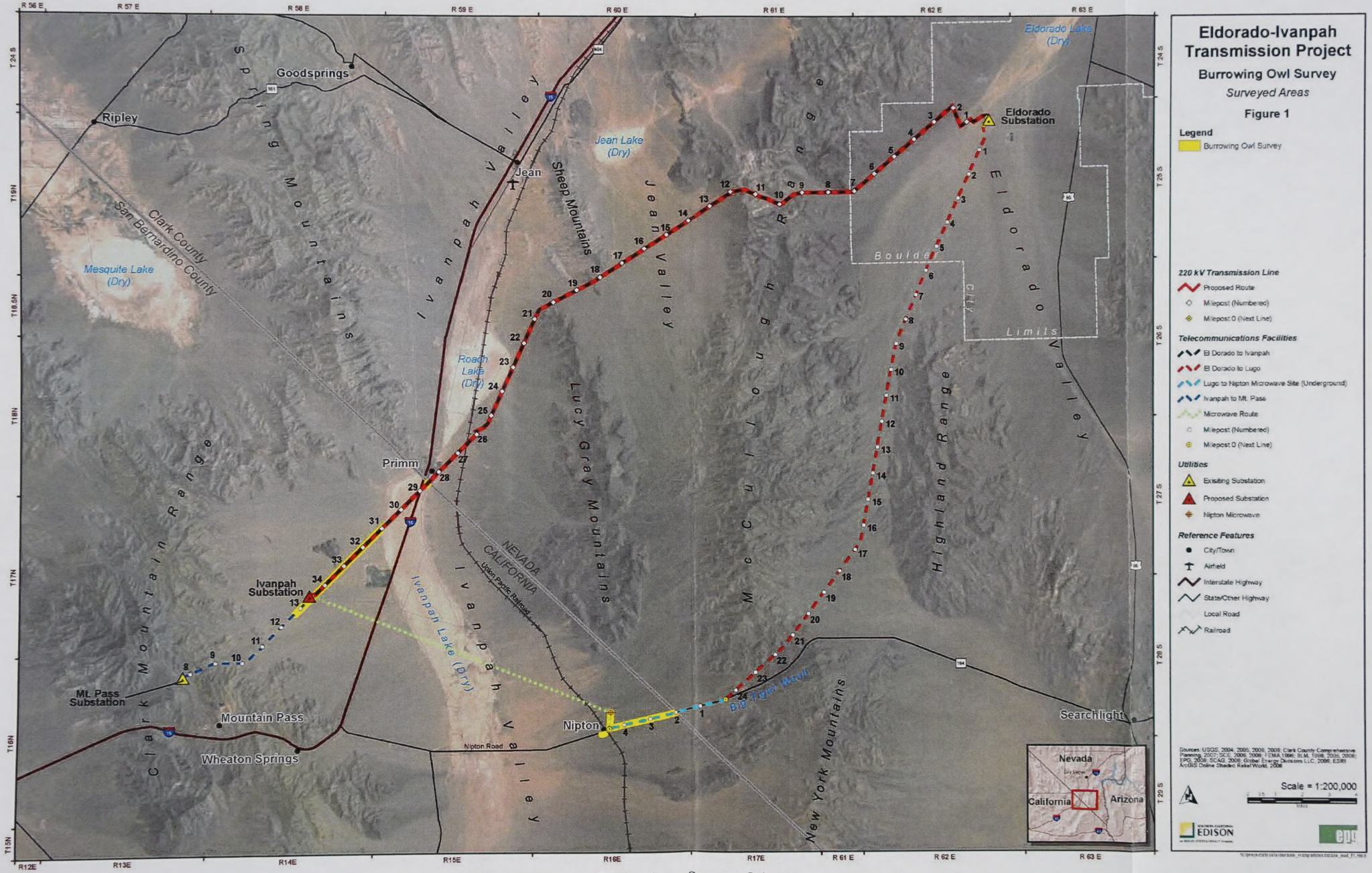
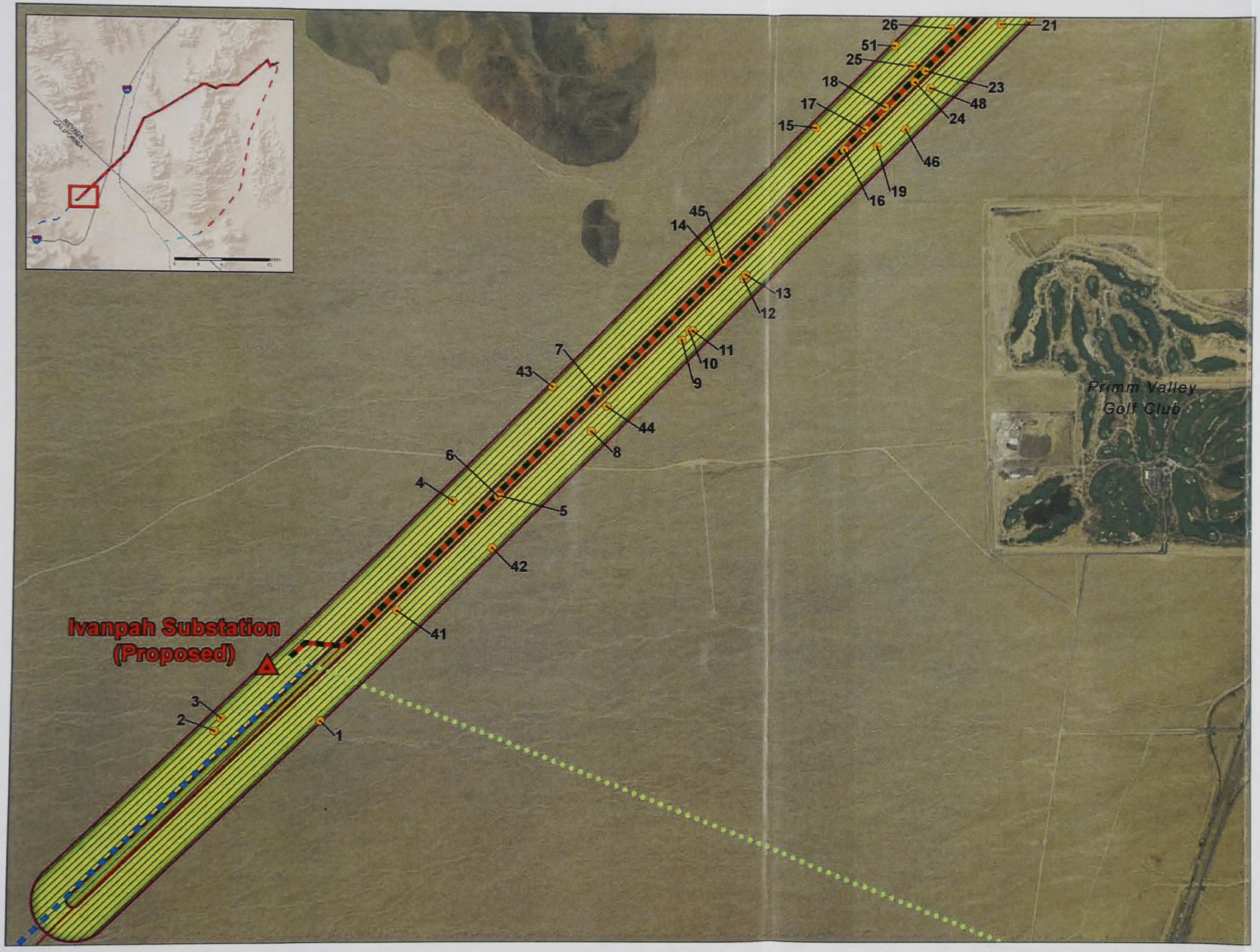


Figure 1. Surveyed Areas



Eldorado-Ivanpah Transmission Project

Burrowing Owl Survey

Main Transmission Line
California Segment - West

Figure 2a

Legend

Burrowing Owl Survey
- Burrow: Unoccupied
- Surveyed Area
- Survey Transect

220 kV Transmission Line
- Proposed Route

Telecommunications Facilities
- El Dorado to Ivanpah
- El Dorado to Lugo
- Lugo to Nipton Microwave Site (Underground)
- Ivanpah to Mt. Pass
- Microwave Route

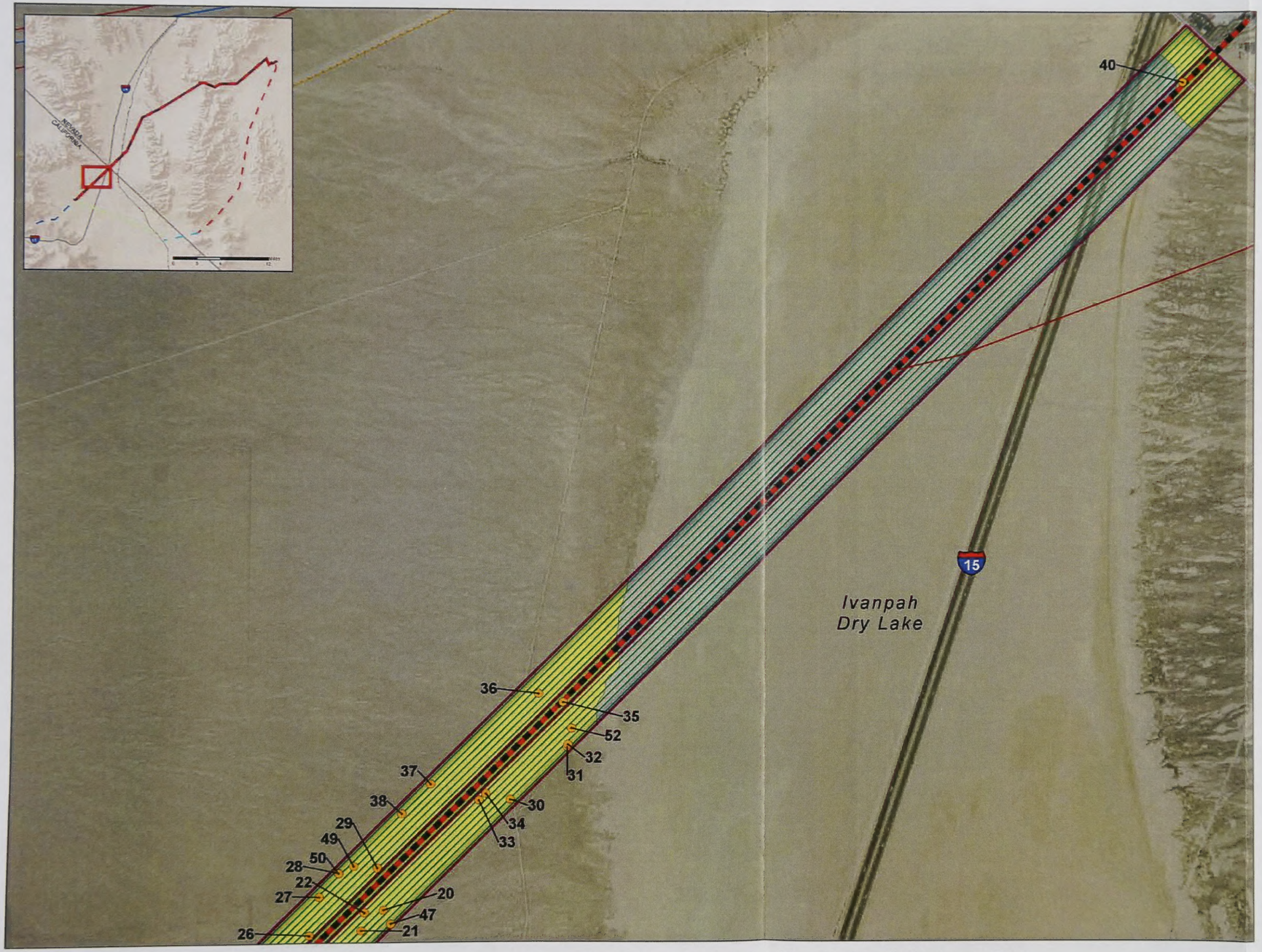
Utilities
- Existing Substation
- Proposed Substation
- Nipton Microwave
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 115 kV Transmission Line
- Existing 69 kV Transmission Line
- Natural Gas Pipeline

0 0.125 0.25 0.5
Miles

Scale = 1:16,500

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2009; FEMA,1996; BLM, 1999, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2008; ESRI ArcGIS Online Shaded Relief World, 2008

Figure 2a. Main Transmission Line; California Segment – West



Eldorado-Ivanpah Transmission Project

Burrowing Owl Survey

Main Transmission Line
California Segment - East

Figure 2b

Legend

Burrowing Owl Survey
- Burrow, Unoccupied
- Surveyed Area
- Survey Transect

220 kV Transmission Line
- Proposed Route

Telecommunications Facilities
- El Dorado to Ivanpah
- El Dorado to Lugo
- Lugo to Nipton Microwave Site (Underground)
- Ivanpah to Mt. Pass
- Microwave Route

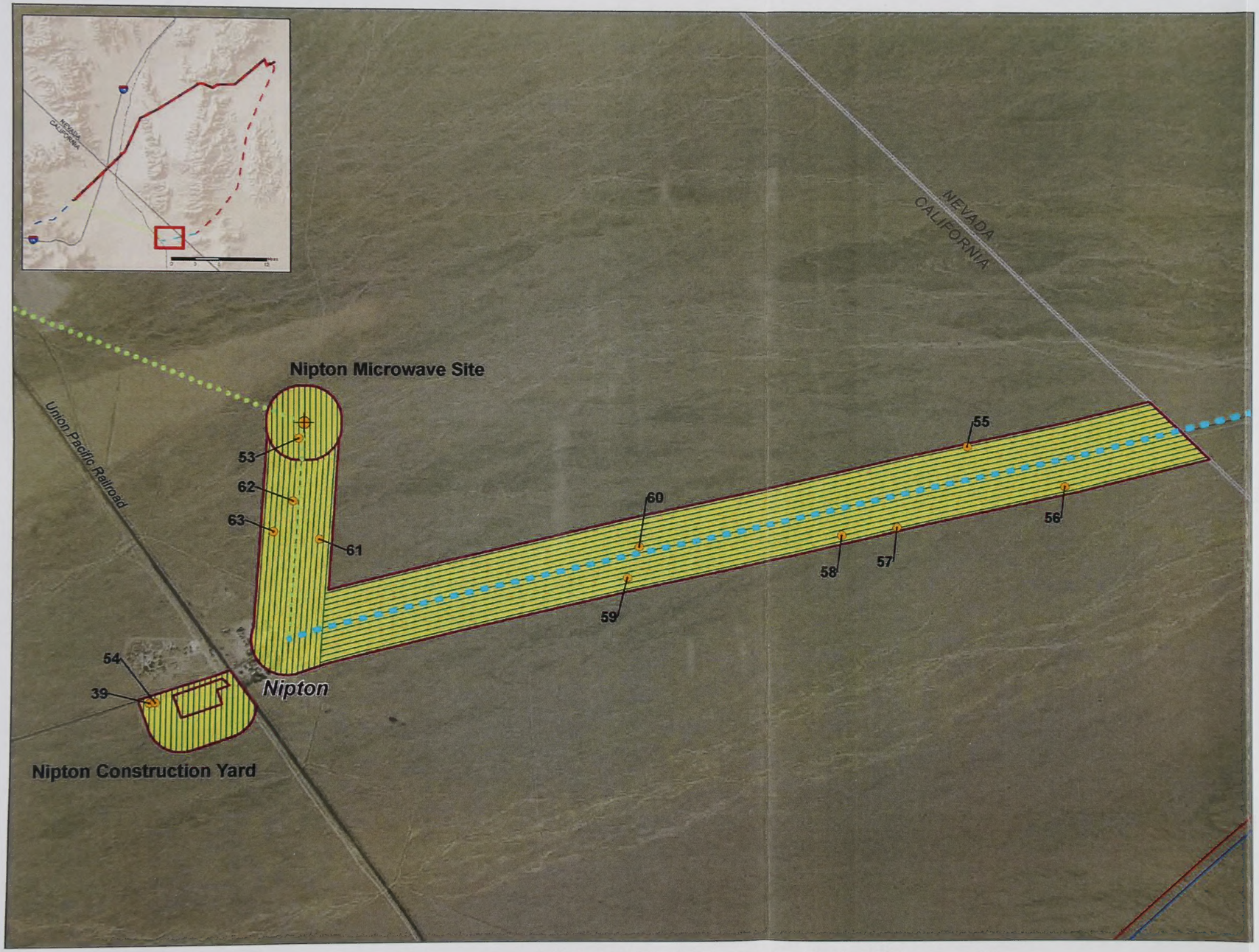
Utilities
- Existing Substation
- Proposed Substation
- Nipton Microwave
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 115 kV Transmission Line
- Existing 69 kV Transmission Line
- Natural Gas Pipeline

0 0.125 0.25 0.5
Miles

Scale = 1:16,500

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2008; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2008; ESRI ArcGIS Online Shaded Relief World, 2008

Figure 2b. Main Transmission Line; California Segment – East



Eldorado-Ivanpah Transmission Project

Burrowing Owl Survey

Nipton Telecommunications Line Microwave Site and Construction Yard

Figure 2c

Legend

Burrowing Owl Survey
- Burrow: Unoccupied
- Surveyed Area
- Survey Transect

220 kV Transmission Line
- Proposed Route

Telecommunications Facilities
- El Dorado to Ivanpah
- El Dorado to Lugo
- Lugo to Nipton Microwave Site (Underground)
- Ivanpah to Mt. Pass
- Microwave Route

Utilities
- Existing Substation
- Proposed Substation
- Nipton Microwave
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 115 kV Transmission Line
- Existing 69 kV Transmission Line
- Natural Gas Pipeline

0 0.125 0.25 0.5
Miles

Scale = 1:16,500

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA 1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2008; ESRI ArcGIS Online Shaded Relief World, 2008

Figure 2c. Nipton Construction Yard and Microwave Site

Appendix A: Photographs

Appendix A: Photographs

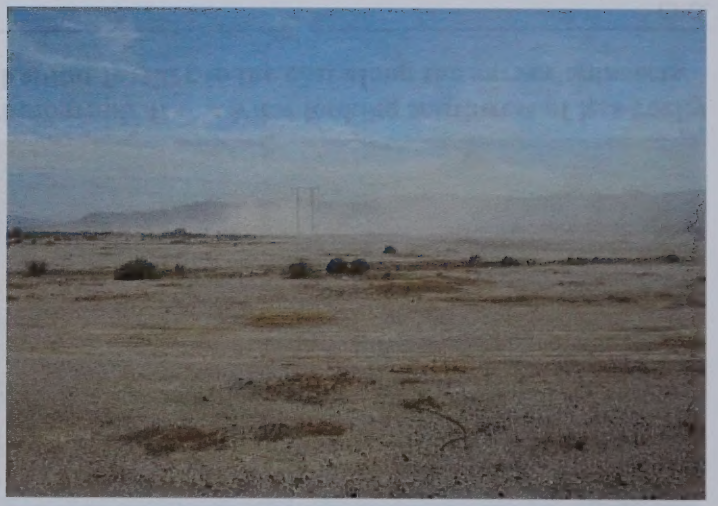
Photograph 1. View looking northeast along the transmission line near the west end of the transects.

Photograph 2. Creosote bush and burrobush-dominated habitat.

Photograph 3. View looking east from the transects at the adjacent solar field construction storage yard.

Photograph 4. View looking southwest of less-rocky habitat further to the east along the survey transects.

Photograph 5. View looking northeast showing thinning vegetation dominated by cattle saltbush near the Ivanpah Lake playa.



Photograph 6. View looking south-southwest showing wind-borne soil coming off the Ivanpah Lake playa on April 28, 2011.

Photograph 7. View looking southwest on the Nipton microwave site. Vegetation dominated by creosote bush and burrobush.

Photograph 8. View looking northeast on the Nipton construction yard site. Vegetation dominated by creosote bush and burrobush.

Photograph 9. View looking northeast of the disturbed portion of the Nipton construction yard site.

Photograph 10. View looking east-northeast showing habitat, along a narrow strip of land across (north of) Highway 164 and the Nipton yard.

Photograph 11. Location #1 (active Badger burrow).

Photograph 12. Location #2 (undetermined burrow).

Photograph 13. Location #3 (tortoise burrow).

Photograph 14. Location #6 (active fox burrow).

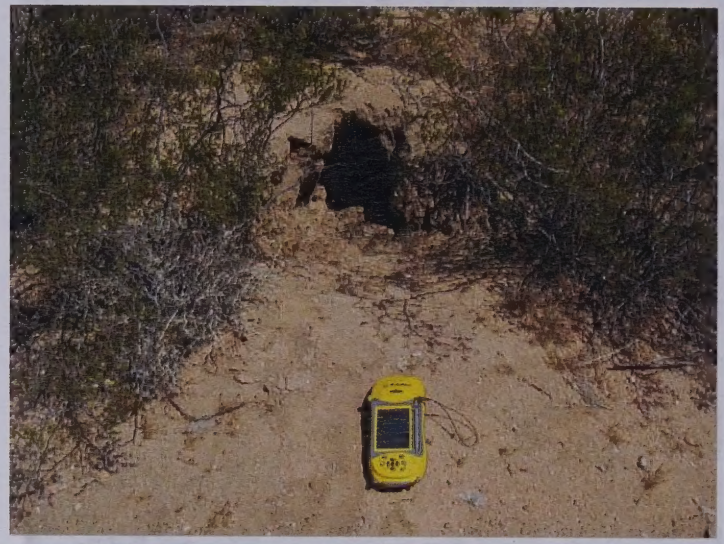
Photograph 15. Location #7 (Coyote burrow, no recent use).

Photograph 16. Location #9 (tortoise burrow, no recent use).

Photograph 17. Location #10 (undetermined burrow, no recent use).

Photograph 18. Location #11 (active Coyote burrow).

Photograph 19. Location #12 (tortoise burrow, no recent use).



Photograph 20. Location #13 (undetermined burrow, no recent use).

Photograph 21. Location #14 (undetermined burrow, no recent use).

Photograph 22. Location #15 (undetermined burrow, no recent use).

Photograph 23. Location #16 (undetermined burrow).

Photograph 24. Location #17 (undetermined burrow, no recent use).

Photograph 25. Location #18 (tortoise burrow).

Photograph 26. Location #19 (Coyote burrow, no recent use).

Photograph 27. Location #20 (undetermined burrow, no recent use).

Photograph 28. Location #21 (undetermined burrow, no recent use).

Photograph 29. Location #22 (Coyote burrow).

Photograph 30. Location #23 (undetermined burrow, no recent use).

Photograph 31. Location #25 (rodent and tortoise burrow).

Photograph 32. Location #27 (tortoise burrow, no recent use).

Photograph 33. Location #28 (tortoise burrow).

Photograph 34. Location #29 (undetermined burrow, no recent use).

Photograph 35. Location #30 (tortoise burrow, no recent use).

Photograph 36. Location #31 (tortoise burrow, no recent use).

Photograph 37. Location #33 (undetermined burrow).

Photograph 38. Location #34 (undetermined burrows).

Photograph 39. Location #35 (undetermined burrow).

Photograph 40. Location #36 (tortoise burrow, no recent use).

Photograph 41. Location #37 (tortoise burrow, no recent use).

Photograph 42. Location #39 (rodent burrow, no recent use).

Photograph 43. Location #40 (multi-burrow rodent complex).

Photograph 44. Location #40 (multi-burrow rodent complex).

Photograph 45. Location #41 (undetermined burrows).

Photograph 46. Location #42 (Badger burrow, no recent use).

Photograph 47. Location #43 (undetermined burrow, no recent use); overview looking west-southwest.

Photograph 48. Location #43 (undetermined burrow, no recent use); close-up of burrow.

Photograph 49. Location #44 (old tortoise burrow occupied by White-tailed Antelope Squirrel); close-up.

Photograph 50. Location #44 (old tortoise burrow occupied by White-tailed Antelope Squirrel); overview looking northeast.

Photograph 51. Location #45 (active Coyote burrow); close-up.

Photograph 52. Location #45 (active Coyote burrow); overview looking northwest.

Photograph 53. Location #46 (Coyote burrow, no recent use); close-up.

Photograph 54. Location #46 (Coyote burrow, no recent use); overview looking southwest.

Photograph 55. Location #47 (tortoise burrow, no recent use); close-up.

Photograph 56. Location #47 (tortoise burrow, no recent use); overview to west-southwest.

Photograph 57. Location #48 (Coyote burrow, no recent use); close-up.

Photograph 58. Location #48 (Coyote burrow, no recent use); overview looking northwest.

Photograph 59. Location #49 (tortoise and rodent burrow complex, no recent use).

Photograph 60. Location #49 (tortoise and rodent burrow complex); bird whitewash, very old (arrow).

Photograph 61. Location #50 (tortoise burrow, no recent use); close-up.

Photograph 62. Location #50 (tortoise burrow, no recent use); overview looking northwest.

Photograph 63. Location #51 (Kit Fox burrow, no recent use).

Photograph 64. Location #51 (tortoise burrow, no recent use).

Photograph 65. Location #52 (tortoise burrow, no recent use); close-up.

Photograph 66. Location #52 (tortoise burrow, no recent use); overview looking northeast.

Photograph 67. Location #53 (active tortoise burrow); Nipton microwave site, close-up.

Photograph 68. Location #53 (active tortoise burrow); Nipton microwave site overview, looking southwest.

Photograph 69. Location #54 (active rodent complex); Nipton construction yard, close-up.

Photograph 70. Location #54 (active rodent complex); Nipton construction yard, view looking north.

Photograph 71. Location #55 (open tortoise burrow).

Photograph 72. Location #56 (open tortoise burrow).

Photograph 73. Location #57 (Active Badger burrow).

Photograph 74. Location #58 (Undetermined burrow, no recent use).

Photograph 75. Location #59 (tortoise burrow, no recent use).

Photograph 76. Location #60 (active Badger burrow).

Photograph 77. Location #60 (overview).

Photograph 78. Location #61 (active tortoise burrow, tortoise present).

Photograph 79. Location #62 (tortoise burrow, no recent use).

Photograph 80. Location #62, overview south towards Nipton.

Photograph 81. Location #63 (tortoise burrow) tracks and recent use

Not Subject to Attorney Client Privilege Identified

Appendix B: Plant Species Identified

Table 2. Plant Species Identified During the EITP Burrowing Owl Surveys					
Common Name	**Scientific Name**	**Transmission Line**	**Nipton Telecom Line**	**Nipton Construction Yard**	**Nipton Microwave**
TREES AND SHRUBS					
Catclaw acacia	*Acacia greggii*	X	X		
Cattle saltbush	*Atriplex polycarpa*	X			
Woolly brickellbush	*Brickellia incana*		X		
Virgin River brittlebush	*Encelia virginensis*	X	X		
Nevada jointfir	*Ephedra nevadensis*	X	X		X
Mormon tea	*Ephedra viridis*	X			
Eastern Mojave buckwheat	*Eriogonum fasciculatum*	X	X		X
Burrobrush	*Hymenoclea salsola*	X	X	X	X
Littleleaf ratany	*Krameria erecta*		X		X
White ratany	*Krameria grayi*	X		X	X
Creosote bush	*Larrea tridentata*	X	X	X	X
Water jacket	*Lycium andersonii*	X	X		
Peach thorn	*Lycium cooperi*		X		
Spiny menodora	*Menodora spinescens*	X			
Desert almond	*Prunus fasciculata*	X			
Mexican bladdersage	*Salazaria mexicana*	X	X		
Saltcedar	*Tamarix ramosissima*	X			
Mojave yucca	*Yucca schidigera*	X	X		X
SUBSHRUBS					
Rayless goldenhead	*Acamptopappus sphaerocephalus*	X	X		
Burrobush	*Ambrosia dumosa*	X	X	X	X
Burningbush	*Kochia scoparia*			X	
Slender poreleaf	*Porophyllum gracile*	X			X
Whitestem paperflower	*Psilostrophe cooperi*	X	X		
Prickly Russian thistle	*Salsola tragus*	X	X	X	

Table 2. Plant Species Identified During the EITP Burrowing Owl Surveys					
Common Name	**Scientific Name**	**Transmission Line**	**Nipton Telecom Line**	**Nipton Construction Yard**	**Nipton Microwave**
Brownplume wirelettuce	*Stephanomeria pauciflora*		X		X
Turpentinebroom	*Thamnosma montana*	X			
CACTI					
Spinystar	*Coryphantha vivipara*	X			
Buck-horn cholla	*Cylindropuntia acanthocarpa*	X	X	X	X
Wiggins' cholla	*Cylindropuntia echinocarpa*	X	X	X	X
Branched pencil cholla	*Cylindropuntia ramosissima*	X	X	X	X
Cottontop cactus	*Echinocactus polycephalus*	X	X		
Engelmann's hedgehog cactus	*Echinocereus engelmannii*	X	X	X	X
California barrel cactus	*Ferocactus cylindraceus*	X	X		X
Matted cholla	*Grusonia parishii*	X	X	X	
Beavertail pricklypear	*Opuntia basilaris*	X	X	X	X
Dollarjoint pricklypear	*Opuntia chlorotica*		X		
Grizzlybear pricklypear	*Opuntia polyacantha* var. *erinacea*		X		
Common fishhook cactus	*Mammillaria tetrancistra*		X		
FORBS					
Cooper's dogweed	*Adenophyllum cooperi*	X	X		
Trailing windmills	*Allionia incarnata*	X			
Mojave milkweed	*Asclepias nyctaginifolia*	X			
Desert marigold	*Baileya multiradiata*	X			
Asian mustard	*Brassica tournefortii*		X		
Booth's evening primrose	*Camissonia boothii*	X		X	
Suncup	*Camissonia* sp.				X
Indian paintbrush	*Castilleja chromosa*				X
Pincushion	*Chaenactis* sp.	X		X	

Table 2. Plant Species Identified During the EITP Burrowing Owl Surveys					
Common Name	**Scientific Name**	**Transmission Line**	**Nipton Telecom Line**	**Nipton Construction Yard**	**Nipton Microwave**
Sandmat	*Chamaesyce* sp.	X			
Brittle spineflower	*Chorizanthe brevicornu*	X	X	X	X
Devil's spineflower	*Chorizanthe rigida*	X	X	X	X
Cryptantha	*Cryptantha* sp.		X	X	X
Coyote gourd	*Cucurbita palmata*			X	X
Utah swallow-wort	*Cynanchum utahense*	X			
Hairy prairie clover	*Dalea mollis*	X			
Jimsonweed	*Datura* sp.			X	
Larkspur	*Delphinium* sp.	X			
Dyssodia	*Dyssodia* sp.	X			
Fleabane	*Erigeron* sp.			X	
Desert trumpet	*Eriogonum inflatum*	X	X		
Buckwheat	*Eriogonum* sp.	X		X	
Woolly easterbonnets	*Eriophyllum wallacei*	X			
Redstem stork's bill	*Erodium cicutarium*	X	X		
Desert poppy	*Eschscholzia glyptosperma*	X			
Langloisia	*Langloisia* sp.	X			
Smooth desertdandelion	*Malacothrix glabrata*	X			
African mustard	*Malcolmia africana*	X			
Whitestem blazingstar	*Mentzelia albicaulis*	X			X
Desert wishbone-bush	*Mirabilis laevis*	X	X		
Mojave desertstar	*Monoptilon bellioides*	X			
Purplemat	*Nama demissum*	X			
Manybristle chinchweed	*Pectis papposa*	X			
Combseed	*Pectocarya* sp.			X	X
Phacelia	*Phacelia* sp.	X			
Odora	*Porophyllum gracile*		X		

Table 2. Plant Species Identified During the EITP Burrowing Owl Surveys					
Common Name	**Scientific Name**	**Transmission Line**	**Nipton Telecom Line**	**Nipton Construction Yard**	**Nipton Microwave**
Velvet turtleback	*Psathyrotes ramosissima*			X	
New Mexico plumeseed	*Rafinesquia neomexicana*	X		X	
Chia	*Salvia columbariae*	X	X		
Desert globemallow	*Sphaeralcea ambigua*	X			
Mojave woodyaster	*Xylorhiza tortifolia*	X	X		
GRASSES					
Cheatgrass	*Bromus tectorum*	X	X		
Low woollygrass	*Dasyochloa pulchella*	X			
James' galleta	*Pleuraphis jamesi*	X	X	X	
Common Mediterranean grass	*Schismus barbatus*	X	X	X	X
Cells with an "X" indicate species documented during the surveys at each site.					

Appendix C: Wildlife Species Identified

Table 3. Wildlife Species Identified During the EITP Burrowing Owl Surveys					
Scientific Name	**Common Name**	**Transmission Line**	**Nipton Telecom Line**	**Nipton Construction Yard**	**Nipton Microwave Site**
MAMMALS					
Black-tailed Jackrabbit	*Lepus californicus*	X			
Desert Cottontail	*Sylvilagus audubonii*	X	X		
White-tailed Antelope Squirrel	*Ammospermophilus leucurus*	X	X		
Valley Pocket Gopher (burrows)	*Thomomys bottae*	X	X		
Desert Wood Rat	*Neotoma lepida*	X	X	X	
Coyote (scats and burrows)	*Canis latrans*	X			
Kit Fox (burrows and scats)	*Vulpes macrotis*	X			
Badger (burrows)	*Taxidea taxus*	X			
Burro (scats)	*Equus asinus*	X			
Domestic cattle (scats)	*Bos taurus*	X			
BIRDS					
Turkey Vulture	*Cathartes aura*		X		
Red-tailed Hawk	*Buteo jamaicensis*	X			
Swainson's Hawk	*Buteo swainsoni*	X			
American Kestrel	*Falco sparverius*	X			
Mourning Dove	*Zenaida macroura*				X
Greater Roadrunner	*Geococcyx californianus*		X		
Lesser Nighthawk	*Chordeiles acutipennis*		X		X
Northern Flicker	*Colaptes auratus*	X			
Say's Phoebe	*Sayornis saya*		X		
Common Poorwill	*Phalaenoptilus nuttallii*				X
Ash-throated Flycatcher	*Myiarchus cinerascens*	X	X		
Western Kingbird	*Tyrannus verticalis*			X	
Loggerhead Shrike	*Lanius ludovicianus*				X
Common Raven	*Corvus corax*	X	X	X	
Horned Lark	*Eremophila alpestris*	X			
Verdin	*Auriparus flaviceps*		X		
Cactus Wren	*Campylorhynchus brunneicapillus*	X			
Sage Thrasher	*Oreoscoptes montanus*	X	X		
Chipping Sparrow	*Spizella passerina*	X			

Table 3. Wildlife Species Identified During the EITP Burrowing Owl Surveys					
Scientific Name	**Common Name**	**Transmission Line**	**Nipton Telecom Line**	**Nipton Construction Yard**	**Nipton Microwave Site**
Black-throated Sparrow	*Amphispiza bilineata*	X	X	X	
Western Meadowlark	*Sturnella neglecta*	X			
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	X			
REPTILES					
Desert Tortoise	*Gopherus agassizii*	X	X		X
Desert Iguana	*Dipsosaurus dorsalis*	X			
Zebra-tailed Lizard	*Callisaurus draconoides*	X			
Common Side-blotched Lizard	*Uta stansburiana*	X			
Yellow-backed Spiny Lizard	*Sceloporus uniformis*		X		
Tiger Whiptail	*Aspidoscelis tigris*	X	X	X	X
Sidewinder	*Crotalus cerastes*	X			

Appendix D: Phase III Survey Dates

Table 4. Phase III Survey Dates				
Burrow ID	**Survey 1**	**Survey 2**	**Survey 3**	**Survey 4**
1	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
2	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
3	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
4	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
5	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
6	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
7	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
8	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
9	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
10	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
11	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
12	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
13	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
14	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
15	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
16	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
17	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
18	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
19	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
20	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
21	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
22	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
23	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
24	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
25	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
26	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
27	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
28	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
29	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
30	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
31	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
32	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
33	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
34	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
35	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
36	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
37	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
38	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
39	6-26-11 PM	6-27-11 PM	6-28-11 PM	6-30-11 AM
40	6-25-11 AM	6-26-11 PM	6-27-11 PM	6-28-11 PM
41	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM

Table 4. Phase III Survey Dates				
Burrow ID	**Survey 1**	**Survey 2**	**Survey 3**	**Survey 4**
42	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
43	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
44	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
45	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
46	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
47	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
48	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
49	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
50	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
51	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
52	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-29-11 AM
53	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
54	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
55	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
56	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
57	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
58	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
59	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
60	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
61	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
62	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM
63	6-26-11 AM	6-27-11 AM	6-28-11 AM	6-30-11 AM

Eldorado-Ivanpah Transmission Project

Raptor and Common Raven Surveys

RAPTOR AND COMMON RAVEN SURVEYS FOR THE ELDORADO TO IVANPAH TRANSMISSION PROJECT

Prepared for
Southern California Edison

Prepared by
EPG, Inc.

April 2011

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INTRODUCTION

EPG, Inc. performed surveys for the presence of raptors and Common Ravens (*Corvus corax*), and evidence of raptor or raven nests on the Eldorado to Ivanpah transmission line, project alternative routes, and the segment of the Eldorado to Lugo transmission line that will be used to support the project fiber optic communication line. The surveys were requested by the Bureau of Land Management (BLM), in compliance with the Migratory Bird Treaty Act of 1918 (MBTA) for the Eldorado to Ivanpah Transmission Project (EITP). The MBTA is administered by the U.S. Fish and Wildlife Service (USFWS), and prohibits take of or trade in most bird species native to the United States, including their eggs and nests. Raptors and Common Ravens often use transmission structures as foraging or resting perches, and substrates for nesting. Nests may be maintained and used constantly or intermittently over multiple years or even decades, creating potential conflicts with maintenance activities on those structures (Arizona Power Line Interaction Committee 2006).

Additional laws protecting some raptors in the project area include the Bald and Golden Eagle Protection Act of 1940 (BGEPA), and the Endangered Species Act of 1973 (ESA), as amended. Amendments to the BGEPA set limits and guidelines relating to take of nests and disturbance of eagles using human-made structures (USFWS 2009). The ESA prohibits harassment and destruction of habitat, as well as take. No bird species currently listed under the ESA were expected to occur or were observed in the project area.

Southern California Edison will remove approximately 36 miles of the existing 115-kilovolt (kV) Eldorado to Ivanpah transmission line between the existing Eldorado Substation in the Eldorado Valley of southern Nevada and the proposed Ivanpah Substation in the Ivanpah Valley in California. The existing line will be replaced with a 230 kV-capacity line, allowing power delivery from the BrightSource solar facility, which is currently under construction. Alternative routes for telecommunications associated with the project include retrofitting existing lines from the Ivanpah Substation to the Mountain Pass Substation in California or a portion of the Eldorado to Lugo transmission line in Nevada.

Initial surveys were conducted in late winter and spring of 2010. This report addresses primarily the results of the recently completed Spring 2011 surveys. Due to the fealty of some raptors to nest sites, the 2010 survey results are pertinent, and retained in the current report for discussion.

METHODS

EPG, Inc. surveyed portions of the project area requested by the BLM, including the existing Eldorado to Ivanpah line between the Eldorado Substation and the proposed Ivanpah Substation site, current project alternatives A through E and telecommunication alternatives where existing transmission line structures are currently in place. Telecommunication alternatives with existing structures include the Eldorado to Lugo line between the Eldorado Substation and Nevada State Route 164, and the segment of the Eldorado to Mountain Pass line that extends west of the proposed Ivanpah Substation (Figure 1).

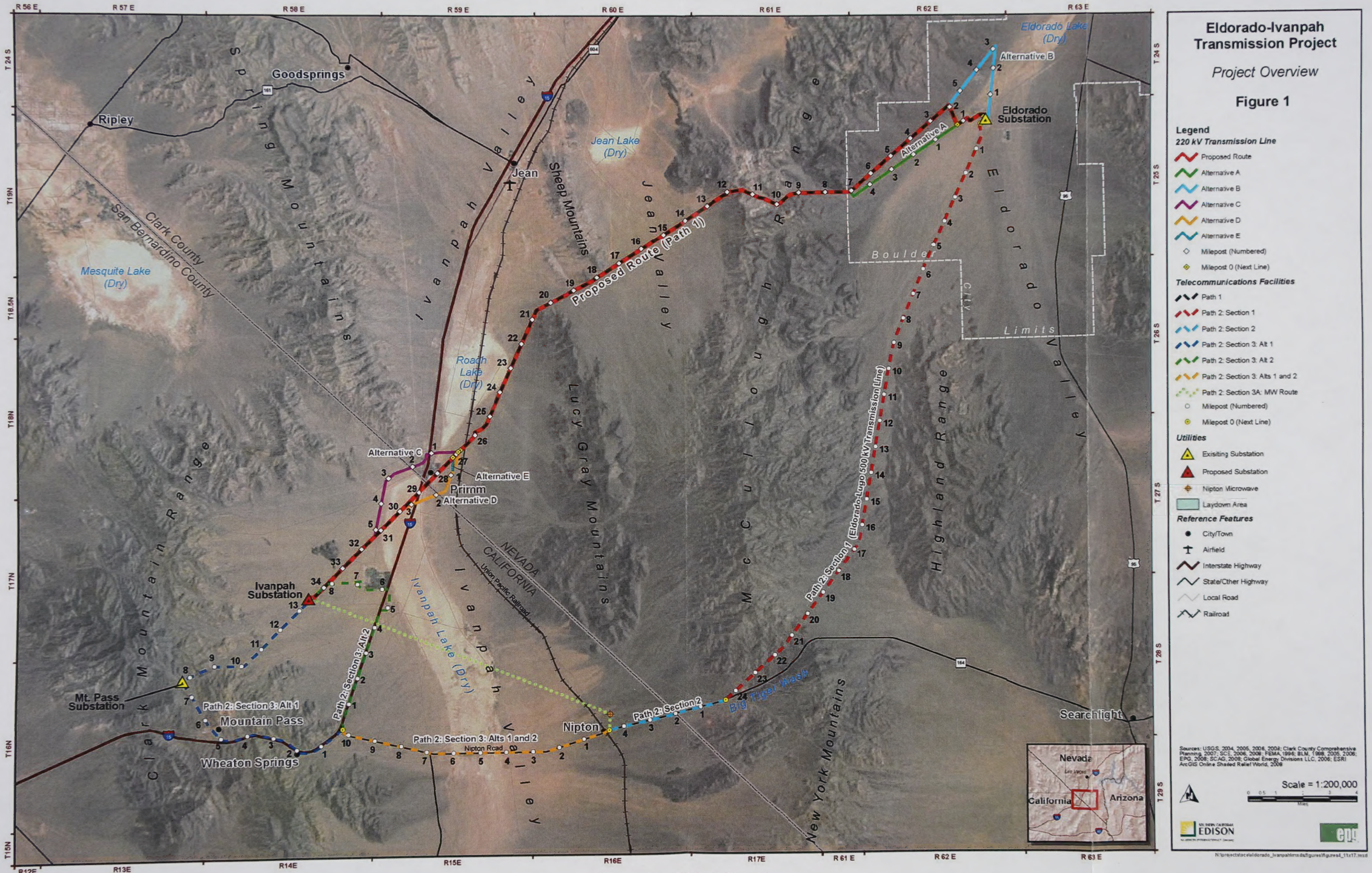


Figure 1. Project Overview

Due to the presence of other transmission lines adjacent to these segments, all transmission line structures in proximity to the project routes were included in the raptor survey. The McCullough Pass area (2 to 3 kilometers south of the project) was also included in the survey effort, due to its proximity to the project alignment and the presence of additional transmission line structures that could be attractive to raptors in the area. The segment of the Eldorado to Mountain Pass line west of the proposed Ivanpah Substation was not included in the 2010 surveys, but was added in 2011.

Two EPG biologists traveled the transmission line access roads by vehicle, visually surveying for raptors and Common Ravens on or near the transmission structures for the affected lines and adjacent lines, and for any evidence of nesting in the transmission structures or nearby cliffs. Binoculars were used to scan utility structures and landform features where raptors may occur. The surveyors would leave the vehicles to visually scan and listen for raptors in areas of high relief, high cover, or poor visibility, such as in mountain passes. Surveyors were also alert for the presence of the Western Burrowing Owl (*Athene cunicularia hypugaea*), which is known to be present in the Ivanpah Valley; there is abundant habitat along the project alignments that could potentially support this species. The most recent surveys were conducted on March 22, 23, and 24, 2011. Previous surveys were conducted on January 13 and 14, April 7 and 8, and May 2 and 3, 2010. Locations of raptors and nests observed were recorded on a handheld Garmin GPS (60CSx) unit, using the UTM NAD 83 datum (Table 1).

Table 1. Raptor and Stick Nest Sightings on the Eldorado to Ivanpah Transmission Line Project – 2010 and 2011

Date	Species	UTM E	UTM N	Zone	Time	Notes
2010						
January 13	Peregrine Falcon	647317	3942722	11S	0920	Perched on tower
January 13	Red-tailed Hawk	649035	3944784	11S	0952	Perched on tower
January 13	Golden Eagle	679203	3960009	11S	1300	Perched on tower
January 14	Red-tailed Hawk	676854	3961739	11S	1020	Flying
January 14	Nest	667813	3931284	11S	1136	Unused, poor condition
April 7	Red-tailed Hawk	677944	3962515	11S	1138	Perched on tower
April 7	Red-tailed Hawk	671752	3936635	11S	1414	Flying
April 7	American Kestrel	631759	3926644	11S	1521	Perched on fence south of substation
April 8	Red-tailed Hawk	657010	3953583	11S	0910	Perched on tower
April 8	American Kestrel	660195	3954801	11S	0930	Perched on *Yucca schidigera*
April 8	Red-tailed Hawk (pair)	662827	3955740	11S	0955	Flying
April 8	Red-tailed Hawk (pair)	663100	3955530	11S	1000	Flying
April 8	Red-tailed Hawk	666895	3956548	11S	1110	Flying
April 8	Prairie Falcon	678660	3962978	11S	1325	Perched on tower with prey
April 8	Red-tailed Hawk	674720	3950200	11S	1430	Flying
April 8	Red-tailed Hawk	673968	3946132	11S	1503	Flying
April 8	Red-tailed Hawk	670250	3935057	11S	1548	Flying

Table 1. Raptor and Stick Nest Sightings on the Eldorado to Ivanpah Transmission Line Project – 2010 and 2011

Date	Species	UTM E	UTM N	Zone	Time	Notes
April 8	Cooper's Hawk	668387	3932184	11S	1602	Flying
April 8	Red-tailed Hawk	667600	3930923	11S	1610	Flying
April 8	Red-tailed Hawk	631275	3929360	11S	1655	Flying
May 2	No raptors identified	–	–	11S	–	–
May 3	Red-tailed Hawk (pair)	655763	3953200	11S	0905	Flying
May 3	Red-tailed Hawk	658621	3955221	11S	9020	Perched on tower
May 3	Red-tailed Hawk	659643	3955830	11S	0934	Perched on tower
2011						
March 22	Common Raven	645279	3943077	11S	0815	Three Common Ravens in flight along line
March 22	Red-tailed Hawk	642987	3938368	11S	0850	Perched on tower
March 22	Swainson's Hawk	641461	3936838	11S	0855	Flying
March 22	American Kestrel	635188	3930636	11S	0935	Perched on *Yucca schidigera*
March 22	Nest	633935	3930531	11S	–	No avian presence observed
March 22	Probable Common Raven nest	633619	3930382	11S	–	Two Common Ravens present at nest
March 22	Probable Common Raven nest	635981	3931390	11S	–	Two Common Ravens present at nest
March 22	Nest	636303	3931696	11S	–	No avian presence observed
March 22	Red-tailed Hawk	638290	3933690	11S	1035	Perched on tower
March 22	Red-tailed Hawk (pair)	658927	3955600	11S	1300	Flying
March 22	Red-tailed Hawk (three)	656820	3950990	11S	1437	Flying; south of line
March 23	Red-tailed Hawk	658838	3955325	11S	0940	Perched on tower; possible nest
March 23	American Kestrel	679766	3966514	11S	1125	Flying
March 23	Red-tailed Hawk	673354	3942653	11S	1330	Flying low among yuccas
March 23	Red-tailed Hawk (pair)	670306	3934672	11S	1420	Flying
March 23	Nest	667440	3930988	11S	–	Unused, poor condition
March 23	Common Raven	666876	3930575	11S	1500	Two Common Ravens perched on tower
March 24	American Kestrel	661679	3957210	11S	0953	Perched on tower
March 24	Prairie Falcon	665257	3959310	11S	1020	Flying along ridge top
March 24	Red-tailed Hawk	673753	3944965	11S	1330	Flying
March 24	Red-tailed Hawk	667816	3931309	11S	1435	Perched on tower; stick nest present*
March 24	Probable Common Raven nest	667816	3931309	11S	1435	Two Common Ravens*

*Two Ravens associated with stick nest; interacted with a single Red-tailed Hawk.

SURVEY RESULTS

Weather conditions during the surveys are given in Table 2. Weather conditions during the 2011 surveys were generally clear, with cool temperatures in the morning and with the temperature rising to the low 60s (Fahrenheit) during the day. Winds were generally light and cloud cover was sparse or nonexistent, except on the last day when cloud cover began accumulating in mid-morning, with coverage reaching approximately 80 percent by the end of the survey day. No precipitation was encountered during surveys, but widespread rainfall, generally from 0.10 inch to 0.25 inch, occurred throughout the area March 21, the day prior to the first 2011 survey.

Table 2. Weather Conditions during Raptor Surveys – 2010 and 2011

Date	High Temperature (F)	Wind (mph)	Cloud Cover	Precipitation
2010				
January 13	55	Up to 10	Mostly cloudy	Light rain early
January 14	60	Light, increasing to 15	Clear	None
April 7	65	Windy, gusts >25	Clear	None
April 8	75	Calm, gusts <5	Clear	None
May 2	75	Breezy, gusts <20	Clear	None
May 3	85	Calm, gusts <5	Clear	None
2011				
March 22	60	Calm, gusts <5	Few, scattered	Isolated; adjacent mountains
March 23	64	Light, gusts <10	Clear	None
March 24	60	AM calm, increasing to <15 by late PM	AM clear; PM increasing clouds to 80% by end of day	None

Four raptor species were observed in 14 independent sightings, including Red-tailed Hawk (*Buteo jamaicensis*) (9), American Kestrel (3), and a single Swainson's Hawk (*Buteo swainsoni*) and Prairie Falcon (*Falco mexicanus*). Three of the Red-tailed Hawk sightings involved more than one bird (see Table 1; Figure 2, panels A–E). All raptors observed from the access roads are included in Table 1. Observations of Common Ravens were also recorded, except for those in proximity to the developments at Primm, Nevada, where the birds have a significant and permanent presence. The Common Ravens in the immediate area around Primm do not appear to be using transmission line lattice towers for nesting, as no nests were observed in the area. The birds may have some nests on the buildings there, but none was evident. One of the pairs of Red-tailed Hawk observed south of Jean Lake exhibited in-flight interactions, indicating they represented a mated pair. The birds were observed in the immediate vicinity of a lattice structure on a line just south of the EITP line at NAD E 658838/N 3955325 (Figure 2b, Panel B). After their in-flight interaction one of the birds returned to the lattice tower, where there appeared to be a couple of sticks at one point on the tower. Although this site is a potential nest site for the pair, it could not be confirmed. No Common Ravens were present in the vicinity of this site while we were in the area. Additional sign of potential raptor activity in the project area included areas of whitewash high on cliffs on the north side of the "North" McCullough Pass, through which the

project alignment passes. The whitewash sites did not appear large enough to support a raptor nest, but are obvious avian perches. These same perches were also observed during the 2010 survey, but no raptors were recorded in the pass that year. The only raptor observed in this area was a single Prairie Falcon on March 24, 2011.

All raptors observed were either flying or perched on transmission line structures or vegetation; no raptor was observed on a nest. No confirmed raptor nesting was detected anywhere along the surveyed routes. Evidence of current or previous avian nesting, in the form of large stick nests or their elements, were present on seven transmission line structures, with one structure supporting two stick nests. Three of the structures with stick nests had two Common Ravens (*Corvus corax*) associated with them during the March 2011 surveys. These birds may represent mated or incipient nesting pairs. A single Common Raven was observed in flight carrying a stick near one of the nests. Because raptors may modify raven nests for their use, raven observations are included in this report. No Western Burrowing Owls or their sign were observed during any of the surveys in 2011 or 2010. Protocol Burrowing Owl surveys for the project will be conducted separately. Other than raven and the one potential raptor nest, no other bird nests were observed on transmission structures in the project area.

The Spring 2011 survey effort included a total of 102 man hours (two persons) of raptor surveys over the approximately 60 miles of project alignments. Areas were covered multiple times. An additional 92 man hours of surveys were conducted for raptors in 2010. With nearly 200 man hours of surveys conducted, the number of raptors observed in the project area totaled only 43 birds. This averages one raptor sighting every 4.5 hours. Some of the observations, particularly of Red-tailed Hawks, were likely repeat observations of some animals on subsequent days. The overall use of the project area by raptors is generally low, with little or no apparent recent use of transmission line structures for nesting in the area. Avian nesting on transmission structures in the area appears to be dominated by Common Ravens.

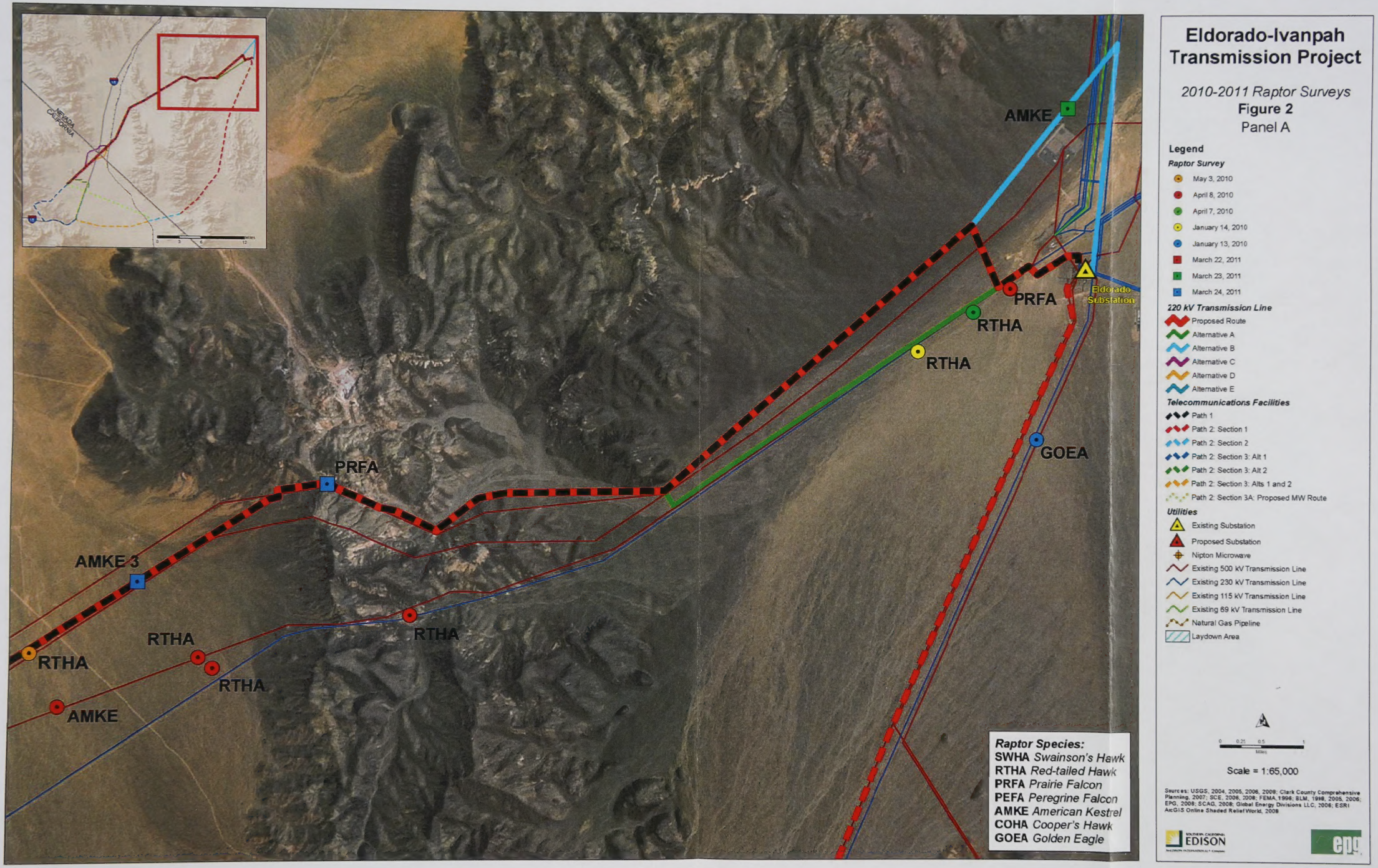
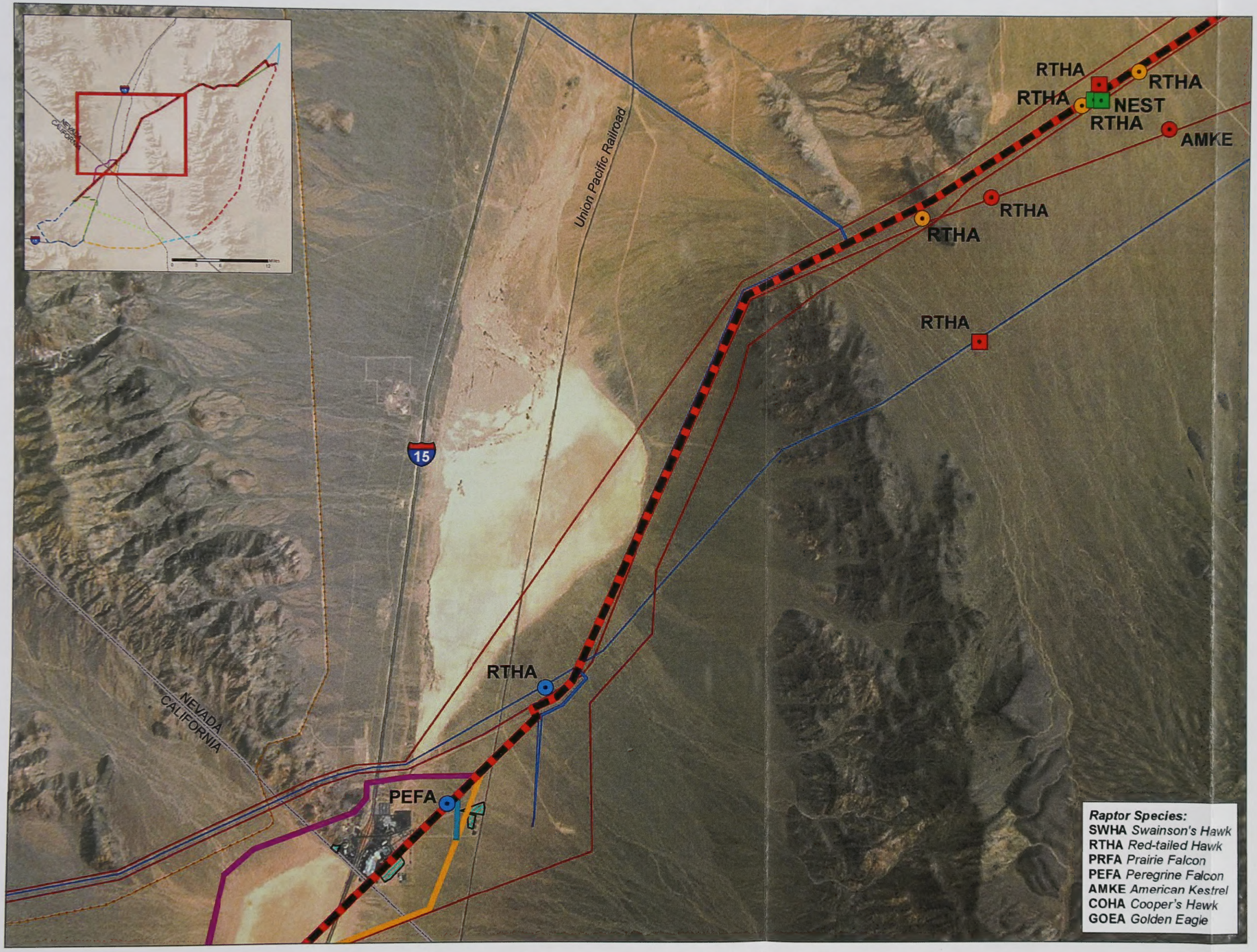


Figure 2a. Panel A



Eldorado-Ivanpah Transmission Project

2010-2011 Raptor Surveys
Figure 2
Panel B

Legend

Raptor Survey
- May 3, 2010
- April 8, 2010
- April 7, 2010
- January 14, 2010
- January 13, 2010
- March 22, 2011
- March 23, 2011
- March 24, 2011

220 kV Transmission Line
- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E

Telecommunications Facilities
- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route

Utilities
- Existing Substation
- Proposed Substation
- Nipton Microwave
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 115 kV Transmission Line
- Existing 69 kV Transmission Line
- Natural Gas Pipeline
- Laydown Area

0 0.25 0.5 1 Miles

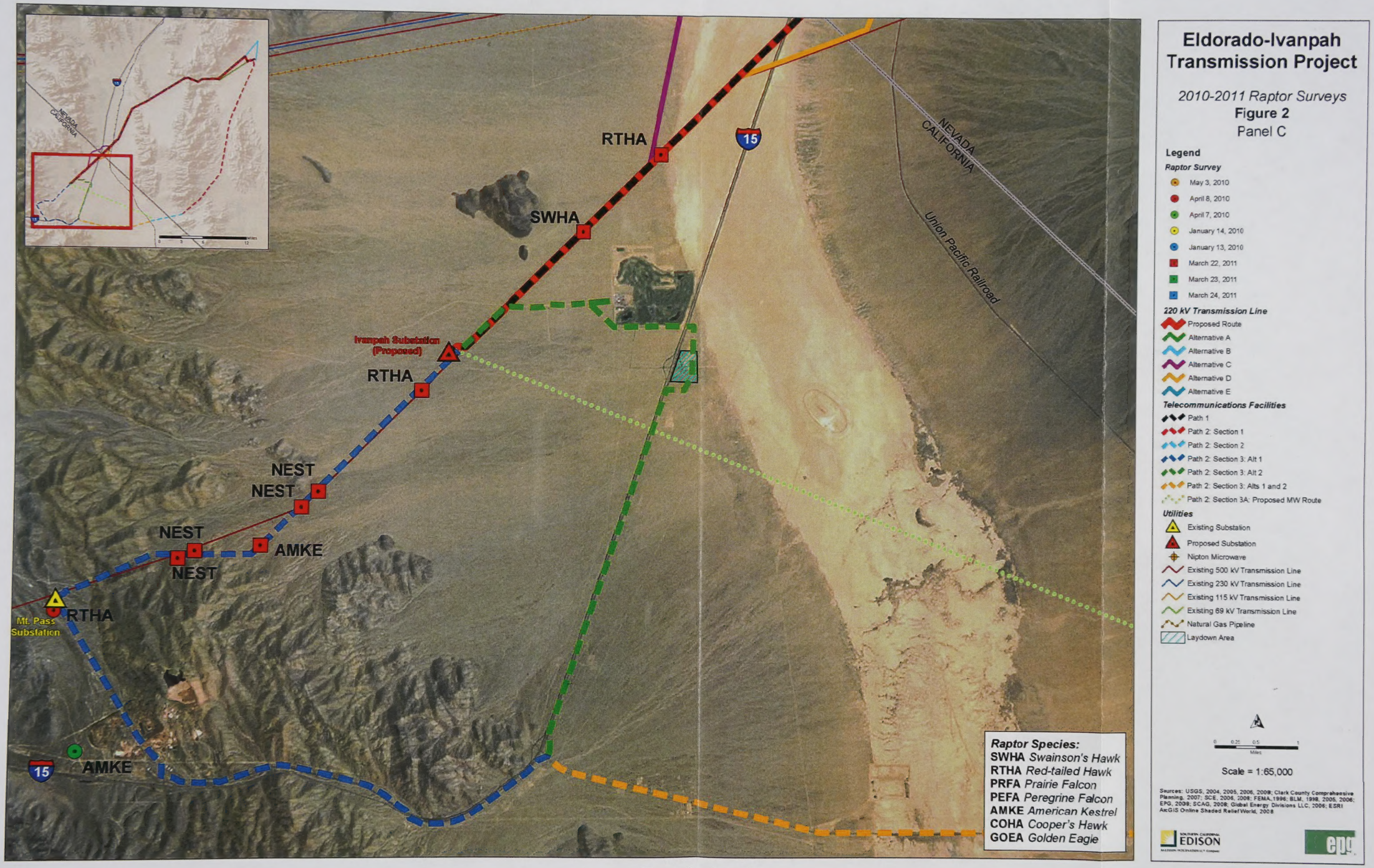
Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2009; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2009; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

SOUTHERN CALIFORNIA EDISON

epg

Figure 2b. Panel B



Eldorado-Ivanpah Transmission Project

2010-2011 Raptor Surveys
Figure 2
Panel C

Legend

Raptor Survey
- May 3, 2010
- April 8, 2010
- April 7, 2010
- January 14, 2010
- January 13, 2010
- March 22, 2011
- March 23, 2011
- March 24, 2011

220 kV Transmission Line
- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E

Telecommunications Facilities
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- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route

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- Existing Substation
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- Existing 69 kV Transmission Line
- Natural Gas Pipeline
- Laydown Area

0 0.25 0.5 1 Miles

Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA, 1996; BLM, 1998, 2005, 2006; EPG, 2009; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

Figure 2c. Panel C

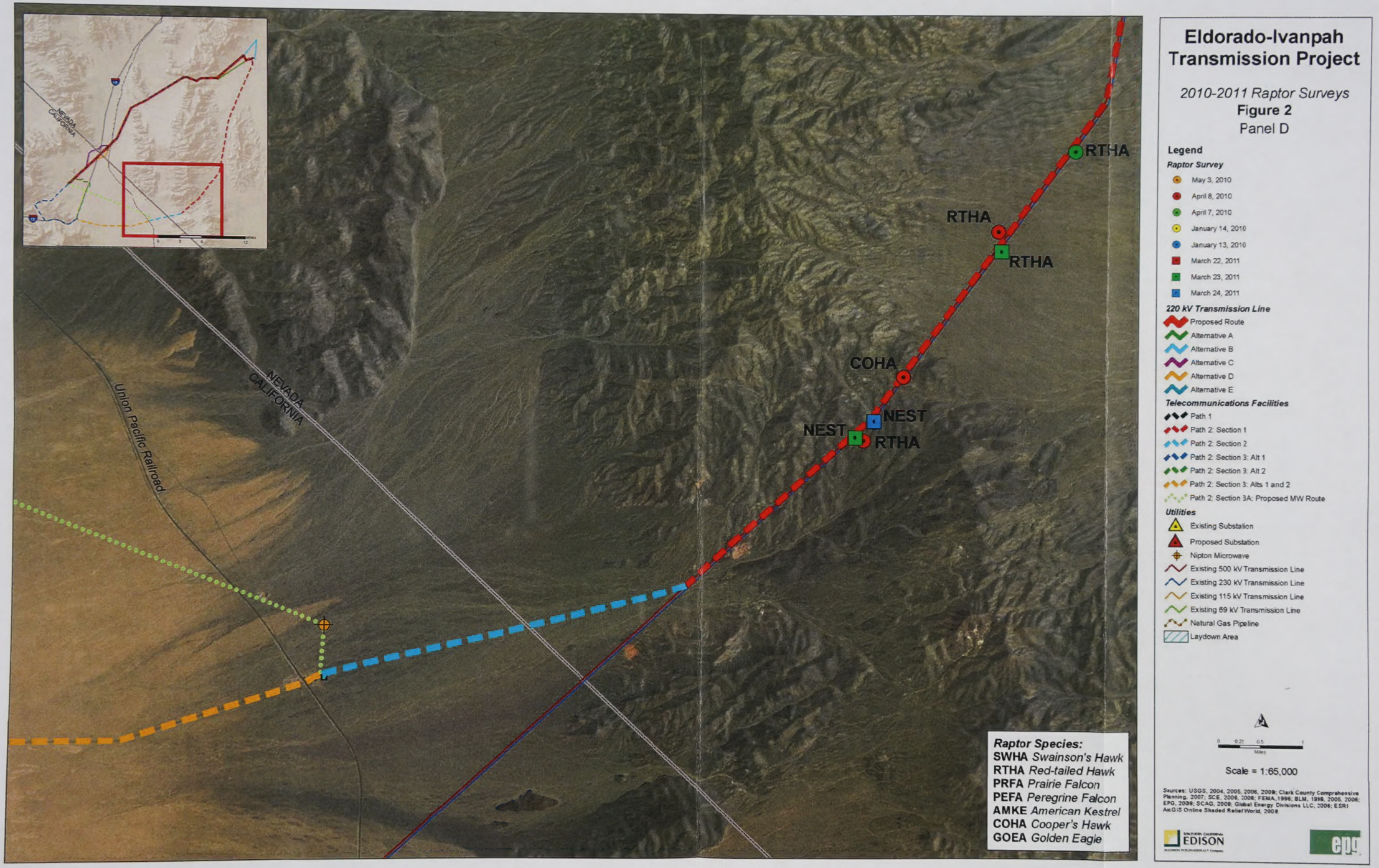


Figure 2d. Panel D

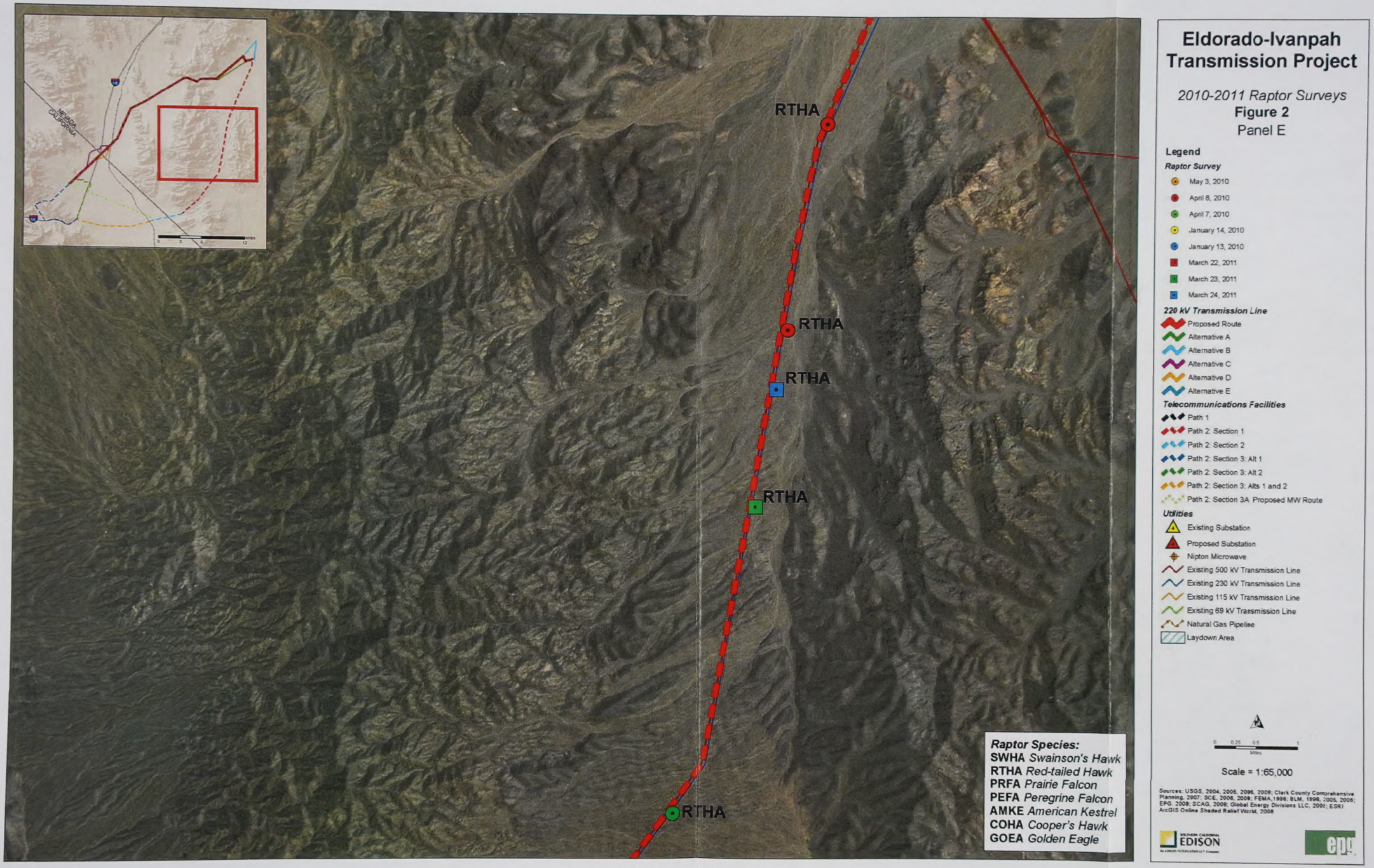
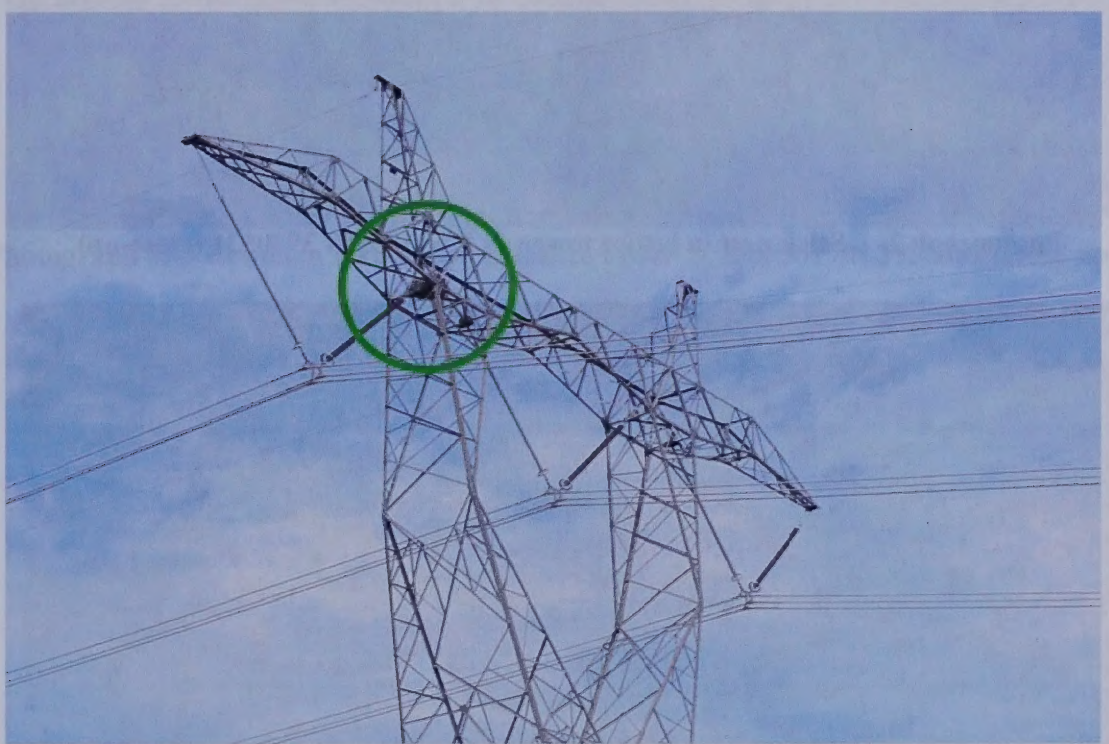


Figure 2e. Panel E

No Golden Eagles (*Aquila chrysaetos*) were observed during the Spring 2011 survey; the single bird observed in January of 2010 may have represented a foraging or vagrant animal. None of the stick nests observed on transmission line structures was anywhere near the size of an eagle nest. The most common raptor observed during the surveys is the Red-tailed Hawk. No active nests of this species were confirmed by the surveys, but some of the observations of two birds together may represent mated pairs, which could potentially use transmission structures for nesting. There is apparently little raptor use of the mountain passes on the project. Observations of raptors in these areas were limited to a couple of Red-tailed Hawks in 2010 near the Mountain Pass Substation, and a single Prairie Falcon in the "North" McCullough Pass during the 2011 survey. Two raptor species observed during the 2010 survey that were not observed in 2011 were the Cooper's Hawk (*Accipiter cooperi*) and the Peregrine Falcon (*Falco peregrinus*).

Selected photographs of some of the stick nests observed on transmission structures are shown below.



Photograph 1. Stick nest in lattice tower @ E 633935/N 3930531

Photograph 2. Stick nest in lattice tower @ E 633935/N 3930531 (close-up)

Photograph 3. Common Raven nest in lattice tower @ E 633619/N 3930382

Photograph 4. Common Raven nest in lattice tower @ E 633619/N 3930382 (close-up)

Photograph 5. Stick nest on lattice tower @ E 635981/N 3931390

Photograph 6. Stick nest on lattice tower @ E 635981/N 3931390 (close-up)

Photograph 7. Partial stick nest in lattice tower @ E 636303/N 3931696

RECOMMENDATIONS

Due to the low numbers of raptors observed and the apparent minimal use of transmission structures in the project area for nesting by these birds, there is a low potential for an active raptor nest occurring within the project area of influence during construction. Nesting Common Ravens are likely to be present during the breeding season on transmission structures. Other birds occasionally use transmission lattice structures for nesting, and potential impacts to these species would be mitigated in the same manner as for the Common Raven. We recommend a final pre-construction clearance survey within 10 days of construction activities occurring during the avian nesting season (late February to early July), to ensure that no new nest construction has occurred. If active avian nests are detected during the construction phase of the project, appropriate mitigation will be required to comply with the ESA, BGEPA, and MBTA, as appropriate. Mitigation for nesting birds can be accomplished by constructing outside of the avian nesting season. Except for ESA protected species and eagles, nests that do not contain eggs or young may be removed. Nests of ESA species or the Golden Eagle will require consultation with the USFWS. Nests that contain eggs or young may be removed only by an appropriately licensed and permitted wildlife rehabilitation contractor.

No ESA listed raptor species were observed during the survey. A single Peregrine Falcon was observed in the project area in January of 2010 near Primm, Nevada. Peregrine Falcons were listed under the ESA, but recovered and were delisted in 1999 (USFWS 1999). Post-delisting monitoring is required under the ESA, and will continue for the Peregrine Falcon until at least 2015 (USFWS 2003), but no actions relating to this project are mandated under the ESA or the monitoring plan for the species.

No Golden Eagle nests have been located in the project area. The single observed eagle was sighted near the Eldorado to Lugo line, which will only receive an additional telecommunication line and not be completely rebuilt. Although individual eagles may avoid the project area during construction, construction activities would not likely meet the definition of "disturb" prohibited under the BGEPA, given the numerous other transmission lines present to provide perches throughout the project vicinity and the extent of contiguous habitat. Prohibited disturbance of a non-nesting eagle is that which causes or is likely to cause injury or "a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior" (USFWS 2009).

REFERENCES

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington D. C. and Sacramento, California. 207 pp.

U.S. Fish and Wildlife Service. 2009. Eagle permits; take necessary to protect interests in particular localities. FR 74 (175): 46836-46879.

_____. 2003. Monitoring plan for the American Peregrine Falcon, a species recovered under the Endangered Species Act. U.S. Fish and Wildlife Service, Divisions of Endangered Species and Migratory Birds and State Programs, Pacific Region. Portland, Oregon. 53 pp.

_____.1999. Final rule to remove the American Peregrine Falcon from the federal List of Endangered and Threatened Wildlife, and to remove the similarity of appearance provision for free-flying Peregrines in the conterminous United States. FR 64 (164): 46542-46558.

Eldorado-Ivanpah Transmission Project

Appendix B – Regulatory Permits and Approvals

Eldorado-Ivanpah Transmission Project

Appendix B1 – Federal Permits

Record of Decision (ROD)

Right-of-Way Grant (500 kV Telecom Route)

Programmatic Agreement

Nation Wide Permit (404) – Permit SPK-2010-00576-SG

Section 7, Biological Opinion (BA/BO)

7460 (1) Permit and Notice Proposed Construction – FAA – Ivanpah

7460 (1) Permit and Notice Proposed Construction – FAA – Nipton

Licenses FCC Frequencies – Tower

Eldorado-Ivanpah Transmission Project

Record of Decision

BLM

Needles Field Office and Las Vegas Field Office

RECORD OF DECISION

FOR THE
ELDORADO-IVANPAH TRANSMISSION LINE PROJECT

MAY 2011

BUREAU OF LAND MANAGEMENT
NEEDLES FIELD OFFICE

1303 South Highway 95
Needles, CA 92363

BUREAU OF LAND MANAGEMENT
LAS VEGAS FIELD OFFICE

4701 North Torrey Pines Drive
Las Vegas, NV 89130

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RECORD OF DECISION

for the

Eldorado Ivanpah Transmission Project

Lead Agency:

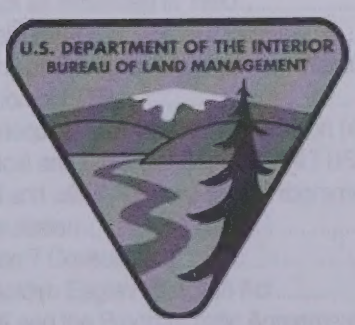
United States Department of the Interior
Bureau of Land Management

Environmental Impact Statement DOI FES 10-56
Case File Number: CACA-49834(NVN-43265)

Eldorado Ivanpah Transmission Project
Decision to Grant Right-of-Way

Bureau of Land Management
Needles Field Office
1303 South Highway 95
Needles, CA 92363
and
Bureau of Land Management
Las Vegas Field Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130

May 2011



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1. Decisions and Authority

1.1 Background

This Record of Decision (ROD) for the Eldorado Ivanpah Transmission Project (EITP) approves the construction, operation, maintenance, and termination (which includes decommissioning) of the proposed EITP 230-kV Transmission Line on public lands in San Bernardino County, California and Clark County, Nevada as analyzed in the "Final Environmental Impact Report/Environmental Impact Analysis Southern California Edison's Eldorado-Ivanpah Transmission Line Project", as noticed in the December 17, 2010, Federal Register. This approval will take the form of Federal Land Policy and Management Act (FLPMA) right-of-way (ROW) grants, issued in conformance with Title V of FLPMA, and implementing regulations found at 43 CFR Part 2800.

One new ROW grant, CACA-49834, will allow Southern California Edison (SCE) the right to use, occupy, and develop the described public lands to construct, operate, maintain, and terminate a 230-kV electric transmission line, a telecommunications line and microwave relay, a new substation, and ancillary access roads related facilities on land that was identified and evaluated in the Final EIS. A second ROW grant amendment to existing ROW grant NVN-066156, will allow SCE to install an overhead optical groundwire for the redundant telecommunications pathway on the existing 500-kV Lugo-Eldorado transmission line.

The existing 115-kV Southern California Edison transmission line is authorized under two different ROW serial numbers, CARI-01730 in California and NEV-43265 in Nevada. These grants were authorized on June 21, 1933 under the Act of December 1, 1928 for the construction of Hoover Dam. The new transmission line ROW grant under the FLPMA, CACA-49834, will replace portions of these two old ROW grants. When the existing transmission line is torn down and replaced with the new 230-kV transmission line, SCE will file applications to relinquish the abandoned portions of the above referenced ROW grants.

This decision is conditioned, however, on implementation of mitigation measures and monitoring programs as identified in the Final EIS, the Biological Opinion (BO) issued by the United States Fish and Wildlife Service (USFWS), the Programmatic Agreement (PA) signed by the California and Nevada State Historic Preservation Officers, and the issuance of all necessary local, state, and federal approvals, authorizations and permits.

This decision approves the EITP Agency Preferred Alternative as analyzed in the Final EIS, which is also referred to as the Selected Alternative in this ROD. During construction there would be disturbance of up to approximately 480 acres in the eastern part of San Bernardino County, and southern Clark County approximately southwest of Las Vegas, Nevada (see Figure 2-3, Appendix 5). The EITP transmission line project includes the following:

1.2 Description of Powerline Project

Eldorado–Ivanpah Transmission Line – A new double-circuit 230-kV transmission line, approximately 35 miles long, would be constructed between the existing Eldorado Substation in Nevada and the proposed Ivanpah Substation in California near Mountain Pass. It would replace a portion of the existing 115-kV transmission line that runs from Eldorado-Mountain Pass-Baker-Dunn Siding and Cool Water Substations. The existing 115-kV transmission line that runs west of the proposed Ivanpah Substation through Mountain Pass-Baker-Dunn Siding and Coolwater Substations would remain unchanged and it not part of the proposed project. The BLM ROW grant for the transmission line and access road under the transmission line will be within a 100 foot wide ROW affecting approximately 419.85 acres of public land.

Subtransmission Line – A proposed 600- to 800-foot-long addition to an existing 115-kV subtransmission line from a connection point would connect the remaining portion of on the existing Eldorado–Mountain Pass-Baker–Cool Water–Dunn Siding 115-kV line would connect to the proposed Ivanpah Substation to the existing 115-kV subtransmission system. The subtransmission line is located within the above transmission line ROW.

Distribution Lines – A proposed 33-kV distribution circuit, consisting of approximately 5,900 feet of overhead lines, would be constructed to provide light and power to the proposed Ivanpah Substation and microwave telecommunications site. Approximately 400 feet of this 33-kV distribution line would be constructed with underground circuitry. This distribution line would be treated as an amendment to an existing Southern California Edison distribution line running between Mountain Pass and the Primm Golf Course. In addition, there would be a new 33kV overhead distribution circuit approximately 2,096 feet long within 20 foot wide ROW containing 0.96 acres from an existing Nipton distribution line to the proposed Nipton microwave telecommunications site.

Telecommunications - Installation of overhead ground wire and optical ground wire along the proposed telecommunication paths and permanent operation and maintenance of additional facilities such as the proposed microwave communication site in Nipton would create both temporary and permanent land disturbances. Temporary disturbance for the telecommunication component would total 33.2 acres. The ROW for the buried portion of the telecommunciations pathway that is located outside the existing Southern California Edison Lugo 500- kV transmission line and extends to the proposed Nipton MW site is within a ROW that is 25 feet and 50 feet in width across 17,433 feet of public land containing 28.38 acres. The Nipton microwave site is 100 feet by 100 feet containing 0.23 acres. The ROW amendment to replace the existing overhead groundwire with an optical overhead groundwire on the Lugo 500-kV transmission line does not change the dimensions of the existing ROW.

Access Road/Spur Roads - The applicant will use the existing transmission line access road to construct the new transmission line. There are some segments of the existing access road located outside the 100 foot wide transmission line ROW, and there are several locations where new access spur roads to tower locations will be constructed. Roads outside the transmission line will be located within 20 foot wide ROWs across 17,433 feet of public land containing 8.98 acres. The access road segments located under the transmission line are included within the transmission line ROW acreages.

Ancillary Facilities - Assembly and erection of the new Lattice Steel Towers, H-frame towers, and Tubular Steel Poles would require laydown areas, material and equipment staging areas, and pulling and tensioning sites. These sites may require vegetation clearing and grading to level areas prior to installation activities. Storage and laydown areas are located on private lands and are not included in the BLM ROW grant.

The acreage associated with the Ivanpah Substation was analyzed in the ISEGS Final EIS and the ROW grant for the substation was issued to Solar Partners, LLC. The final substation area is approximately 17 to 20 acres within the boundary of the ISEGS construction logistics area. The ISEGS project is completing the initial grading, leveling and ground preparation for the Ivanpah substation. Once the Ivanpah Substation is constructed, SCE will request an assignment of the substation area and BrightSource Energy would likely request a partial relinquishment of the 17 to 20 acre substation area out of their construction logistics area ROW grant, serial number CACA-49502.

Short term use areas – The applicant has identified areas that will be needed during construction for short periods that will be reclaimed and not used again. These sites have been requested for a three year term to accommodate construction and reclamation of the sites.

Pull/Splice/tensioning sites will be needed during construction on the new transmission line and along the Lugo transmission line ROW. Tensioning sites can average 500 feet by 150 feet in size while splice and pull sites are generally smaller at 150 by 200 feet. There will be approximately 54.12 acres of temporary pull/splice/tensioning sites needed during construction. The sites may or may not be fully graded depending on terrain and vegetation

cover. The applicant has also proposed two helicopter staging and refueling sites on public lands affecting 2.04 acres.

The EITP Project ROW grant, CACA-49834, will be issued to SCE, for a term of 30-years and will contain a right of renewal. In order to renew a ROW grant, the holder must submit an application to BLM showing the holder is complying with the terms, conditions, and stipulations contained in the grant and applicable laws and regulations. BLM has the discretion to renew the grant if doing so is in the public interest. The company, may, on approval from the BLM, assign the ROW grant to another party in conformance with 43 CFR 2800 regulations. Construction of the project is currently planned to start in the summer of 2011 but is contingent upon the holder supplying and BLM approving of the final engineering design construction plans as part of the final POD. Final approval will take the form of an official Notice to Proceed (NTP) with construction. Until a NTP is approved by BLM, no surface disturbing activities can occur. A shorter three year term ROW grant, CACA49834-01, will be issued to SCE for use of the temporary helicopter staging areas, and for pull/splice/tensioning areas.

In addition, SCE cannot begin construction until compliance with applicable federal, state and local laws and regulations is completed.

SCE has also submitted a request for a NTP with geotechnical soil borings upon approval of the ROW grant. The borings are necessary to gather data required to design tower foundations. Approximately 50 borings will be made 25 to 75 feet deep with soil and rock core samples collected for analysis. These activities would be closely monitoring by qualified cultural resources, and biological monitors. Access for this work will be confined to existing access road alignments to get to proposed tower locations.

1.3 Application/Applicant

SCE is a U. S. Corporation that has demonstrated they are qualified to hold ROW grants on Federal land. The company is one of the largest electric distribution companies in the United States providing electricity to nearly 14 million people in a 50,000 square mile service area in central and southern California. They operate 16 transmission utility interconnections with 4,900 transmission and distribution circuits.

A ROW application pursuant to Title V of FLPMA was filed with the BLM for the use of public land associated with the EITP project. The California BLM State Director was designated as the Lead State for preparing the analysis of the project in both California and Nevada for BLM. The Needles BLM Field Manager was further delegated authority to sign this Record of Decision. ROW grant CACA-49834 will be issued for the transmission line and related facilities on public lands located in California and Nevada by the Needles Field Office Manager. The Las Vegas Field Manager will issue the ROW grant amendment allowing installation of the telecommunication line on ROW NVN-066156.

1.4 Purpose and Need for the Proposed Action

The BLM's purpose and need for the EITP is to respond to SCE's application under Title V of the Federal Land Policy and Management Act (FLPMA; 43 USC 1761) for a ROW grant to construct, operate and decommission a 230-kV electric transmission line, substation, and associated infrastructure on public land in compliance with FLPMA, BLM ROW regulations at 43 CFR 2800, and other applicable federal laws. The decision is to grant the ROW as described in the FEIS preferred alternative.

1.5 EIS Availability

The BLM prepared a Draft EIS for the proposed transmission line project that analyzed the applicant-proposed 230-kV transmission project, alternatives that rerouted portions of the transmission line, alternative telecommunications pathways, and a no action/no construction alternatives. The Draft EIS was circulated for agency and public review on

May 7, 2010 with a 45-day public comment period. Those comments and BLM's responses are provided as appendices in the Final EIS. Comments on the Draft EIS were utilized to revise the Final EIS.

Copies of the Final EIR/EIS (DOI Control No. 10-56), dated November 1 2010, are available at the BLM Needles Field Office (1303 S. Highway 95, Needles, California 92363) and the BLM Las Vegas Field Office (4701 North Torrey Pines Dr., Las Vegas, Nevada, 89130). The Final EIS is also available online at the BLM website at: http://www. blm. gov/ca/st/en/fo/needles/nefo_nepa. html.

After issuing this ROD, the BLM will publish a Notice of Availability of the ROD in the Federal Register.

1.6 Authority Under FLPMA and NEPA

FLPMA. BLM's authority for the project is the FLPMA, which establishes policies and procedures for management of public lands. In Section 102(a)(8) of the FLPMA, Congress declared that it is the policy of the United States that:

> *...the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use (43 USC Part 1701(a)(8)).*

Section 202 of the FLPMA and the regulations implementing the FLPMA land use planning provisions (43 CFR Subparts 1601 and 1610) provide a process and direction to guide the development, amendment, and revision of land use plans for the use of the public lands.

Title V of the FLPMA, 43 USC 1761–1771, authorizes the BLM, acting on behalf of the Secretary of the Interior, to grant, issue, or renew rights-of-way over, under, and through the public lands for systems for generation, transmission, and distribution of electric energy. The BLM's implementation of its statutory direction for ROW authorizations is detailed in 43 CFR Part 2800. The Authorized Officer (AO) administers the ROW authorization and ensures compliance with the terms and conditions of the ROW grant. The AO means an employee of the Department of the Interior (DOI) to whom the authority to perform the duties described in 43 CFR Part 2800 has been delegated. This authority is derived from the authority of the Secretary of the Interior, and may be revoked at any time. The authority to approve all actions pertaining to the granting and management of Title V ROWs on public lands is delegated to the respective BLM State Directors (BLM Manual 1203, Appendix 1, p. 33). In California, the authority of the BLM State Director to approve actions pertaining to the granting and management of Title V ROWs has been further delegated to the Field Manager (Needles Field Office) who will be responsible for managing this grant. Although CACA-49834 will authorize the use of public lands in two states (California and Nevada), the BLM Director identified California as the lead State for BLM in the processing of this specific ROW application.

NEPA. Section 102(c) of NEPA (42 USC 4321 et seq.) and the Council on Environmental Quality (CEQ) and DOI implementing regulations (40 CFR Parts 1500–1508 and 43 CFR Part 46) provide for the integration of NEPA into agency planning to insure appropriate consideration of NEPA's policies and to eliminate delay. When taking actions such as approving ROW grants, the BLM must comply with the applicable requirements of NEPA and the CEQ NEPA regulations. Compliance with the NEPA process is intended to assist federal officials in making decisions about a project that are based on an understanding of the environmental consequences of the project. The Draft EIS, Final EIS, and this ROD document BLM's compliance with the requirements of NEPA for the EITP.

BLM Land Use Plans. In furtherance of its authority under the FLPMA, BLM manages public lands in the California Desert District pursuant to the California Desert Conservation Area (CDCA) Plan of 1980, and its amendments. The CDCA Plan includes an Energy Production and Utility Corridor Element, which designates a regional network of utility

planning corridors. The EITP would replace an existing SCE 115-kV transmission line located within an existing designated corridor. BLM manages public land in the Las Vegas Field Office in accordance with the Las Vegas Resource Management Plan (RMP) signed October 5, 1998. The project is in conformance with the Las Vegas RMP Record of Decision as it states in RW-1-h, all public lands within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for rights-of-way under the authority of the Federal Lands Policy Management Act. Additionally, the proposed project would be in conformance with West Wide Energy Corridor Programmatic EIS, which amended the CDCA Plan and the Las Vegas RMP by acknowledging the existing utility corridor.

Because the transmission systems are an allowable use of the land in established energy corridors, the proposed project does not conflict with any applicable BLM land use plans.

Other Authorities and Policies. In conjunction with the FLPMA, BLM is subject to other authorities including:

- The federal Energy Policy Act (EPAct) of 2005 requires the approval of at least 10,000 MW of renewable energy on public lands by 2015; Currently, proposed renewable energy projects amounting to approximately 1,400 MW of electricity are on file with the BLM for the Ivanpah Valley area. Several of these projects are identified to potentially interconnect with EITP. The Energy Policy Act (119 Statutes 594, 600), Section 368, also requires the DOI, in conjunction with the departments of agriculture (USDA), energy (DOE), commerce (DOC), and defense (DOD), to designate pipeline and electric transmission corridors for the 11 contiguous western states and establish procedures to expedite the review of projects that would be located within established energy corridors. Section 368 specifically notes the need for upgraded and expanded electric transmission infrastructure in the western United States to improve reliability, relieve congestion, and improve the capacity of nationwide electric transmission.
- Executive Order 13212 (May 18, 2001) which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "...production and transmission of energy in a safe and environmentally sound manner."
- Secretarial Order 3285 (March 11, 2009), which "...establishes the development of renewable energy as one of the highest priorities for the Department of the Interior."

These authorities and policies are discussed in Section 1.2 of the FEIS.

1.7 Information Still Under Review since the Final Environmental Impact Statement

Since the preparation and publication of the Final EIS, the applicant has been completing ongoing coordination with several agencies per requirements of mitigation measures listed in the FEIS. The applicant has filed an application with the FAA for a flight hazard analysis based on their preliminary transmission line design near the proposed Southern Nevada Supplemental Airport (SNSA). A final flight hazards analysis determination by FAA cannot be made until SCE completes final engineering designs and may require SCE to modify the transmission line to minimize flight hazards. Mitigation Measure MM Haz-2 requires SCE to comply with any FAA requirements upon completion of the SNSA.

Under Secretarial Order 3310, signed on December 23, 2010, the BLM is required to maintain an updated inventory of wilderness characteristics and to incorporate consideration of these characteristics in all land use planning and project level decisions. Although this Final EIS was completed prior to the signing of Secretarial Order 3310, it followed interim California BLM guidance related to consideration of wilderness characteristics and is in conformance with the Secretarial Order and associated BLM manuals. Specifically, the inventory was updated as described below.

The BLM reviewed the Wilderness Inventory Units (WIU) established in 1979 located on the California side of the Ivanpah Valley. The ISEGS FEIS concluded that the imprints of man were substantially noticeable and that opportunities for solitude and primitive recreation were not outstanding. The EITP project crosses these same WIU's that continue to contain signs of mining and many roads and routes, and utility lines. The WIUs did not contain outstanding opportunities for solitude due to their size combined with only light vegetative and topographic screening. No one recreational opportunity or combination of recreational opportunities was considered outstanding. Virtually all routes within these affected WIUs were designated as 'open' in a CDCA LUP Amendment and continue to be distinct due to vehicle use. Approximately five ROW grants for additional facilities have been approved in these WIU since 1980.

The CDCA Plan also designated three ROW corridors generally running east to west across the Ivanpah Valley within these WIU's. These corridors are occupied by multiple 115-kV to 500- kV electric transmission lines, roads, natural gas pipelines, and products pipelines. Imprints of man remain substantially noticeable and opportunities for solitude and primitive recreation are not outstanding. In summary, none of the California WIUs contains lands with wilderness characteristics.

In Nevada, the WIU's have not been updated. However, there is also a designated ROW corridor located between the Eldorado Valley and the Ivanpah Valley. This corridor contains four or more existing electric transmission lines ranging from 115-kV to 500- kV in size that extend toward Roach Lake and Primm, NV before connecting with the designated ROW corridors mentioned above in California. There are two Wilderness Study Area units, one located North of McCollough Pass and one South of McCollough Pass. The designated ROW corridor is approximately 2 miles wide where it passes between these two Wilderness Study Areas.

This Decision will allow the applicant to remove their existing 115-kV transmission line and replace it with a larger double circuit 230-kV transmission line within the same ROW. The transmission line is located in the designated ROW corridor next to several other transmission lines. The redundant telecommunications fiber optics portion of the project will be placed on existing 500 kV transmission towers and buried in the shoulder of a paved highway.

The Draft BLM 6303 Manual contains the following guidance for When Wilderness Inventory Is Not Required:

> If the project is in conformance with the existing land use plan, the BLM manager shall make an initial determination as to whether or not wilderness characteristics, as defined by BLM Manual 6301, are clearly lacking in the area affected by the project. If wilderness characteristics are clearly lacking and documented as such, the project can be considered without conducting a wilderness inventory. Lands that clearly lack wilderness characteristics are those that do not meet the naturalness criterion set forth in BLM Manual 6301, because they have extensive surface disturbance and/or do not meet the size criterion of 5,000 acres or any of the size exceptions.

It is clear that the affected public lands, which contain multiple electric transmission lines and associated access roads within designated ROW corridors clearly lack wilderness characteristics due to a lack of naturalness. Therefore, a wilderness inventory is not warranted for these lands. Because wilderness characteristics are not present in the project area they will not be considered further in this Decision.

1.8 Decisions Being Made (40 CFR 1505. 2(a))

1.8.1 Bureau of Land Management Right-of-Way Grant

Under federal law, the BLM is responsible for processing requests for ROW grant applications to determine whether, and under what terms and conditions, to authorize proposed projects such as renewable energy projects, transmission lines, and other appurtenant facilities on land it manages. Because the project is a privately initiated

venture that will be sited on lands managed by the BLM, Southern California Edison (the applicant), applied for a ROW grant from BLM pursuant to regulations. The approved ROW grant includes terms and conditions based on the Final EIS, the Biological Opinion, the Programmatic Agreement, and other federal rules and regulations applicable to federal lands. On approval of the ROW grant, the applicant will be authorized to construct and operate the 230kV transmission line once it meets the requirements specified in the ROD. The ROD requires the applicant to secure a Certificate of Public Convenience and Necessity from the California Public Utilities Commission and prepare a final POD that includes final engineering and design drawings, before BLM will issue a NTP to the applicant. On receipt of the NTP, the applicant will be authorized to construct and operate the 230kV transmission line project and all ancillary facilities. To the extent the Selected Alternative does not progress to construction, operation, or is proposed to be changed to the extent that it appears to the BLM to be a new project proposal on the approved project site, that proposal is subject to NEPA review.

Lands and interests in lands to be authorized for use in the BLM ROW grant include vacant public land located in the States of California and Nevada, and land reserved for administration by the BLM for right-of-way purposes in patent number 27-95-002, dated July 9, 1995.

1.8.2 No Revisions to Open Off-Highway Vehicle Routes

In 2002, the BLM updated access plans and routes in the ***Northern and Eastern Mojave Desert Management Plan*** (NEMO) Amendment to the CDCA Plan. The NEMO Amendment assigned and/or revised access for off-highway vehicle (OHV) routes in the northern and eastern Mojave Desert. The existing power line road between Ivanpah Dry Lake and the Ivanpah Substation is in a designated open route that will not be changed by the project. The Las Vegas RMP Record of Decision allows public vehicle use on authorized access roads and spur roads in this project area. No open vehicle routes will be terminated or closed by issuance of the ROW grant, although there may be occasional needs to limit public use on routes for short terms to minimize public safety hazards associated with hauling heavy equipment and materials to tower sites. Any short term restrictions will be coordinated with local BLM offices in Needles and Las Vegas and the public informed appropriately.

1.8.3 What is Not Being Approved

Under NEPA, related actions can be considered in an environmental document as "connected," "cumulative," or "similar" actions. NEPA regulation requires that the federal agency consider the proposed action and other "connected" or "cumulative" actions in the same EIS (40 CFR 1508. 25). An agency may, but is not required to, consider other "similar" actions in the same environmental document.

The BLM determined that the Ivanpah Solar Electric Generating System (ISEGS) project constituted a "cumulative" action for the EITP EIR/EIS. Rationale for defining ISEGS as a cumulative action are described on pages 1-5 through 1-8 of Vol 1 of the Final EIR/EIS. The ISEGS project was filed by corporations formed by BrightSource Energy as the parent company. The ISEGS project was analyzed in a separate EIS (See FES10-31) and a Record of Decision for the project was signed on October 7, 2010. Therefore, the ISEGS project is not being approved by this decision.

1.9 Right-of-Way Requirements (43 USC 1764; 1765)

SF 2800-14 BLM (Right-of-Way Grant), the instrument to authorize the right-of-way grant for the project, includes terms, conditions, stipulations, and measures required as part of the grant authorization. Consistent with BLM policy, the EITP ROW grant will include a performance bonding requirement for installation of facilities consistent with the approved POD. The bond will be calculated upon submission of the final engineering and design and updates to the project Plan of Development. Construction of the EITP transmission line must commence within 5 years after the effective date of the ROW grant.

1.10 Summary of Conclusions

The Selected Alternative for the EITP is the alternative that provides the most public benefits and avoids the most resource impacts. Potential impacts associated with the construction, operation, and maintenance of the proposed action and alternatives to the proposed EITP (including the No Project Alternative) were identified and discussed for each resource in Sections 3.2 to 3.14 of the Final EIR/EIS. Impacts identified for each resource area and alternative were compared with those identified for the proposed project, in terms of potential changes in the intensity, magnitude, and spatial and temporal extent of potential effects for NEPA.

1.10.1 Summary of the Comparison of Environmental Impacts

1.10.1.1 Transmission Routing Alternatives

Construction, operation and maintenance of the Selected Alternative would have the least land disturbance because it is the shortest length alternative. This alternative would place the entire transmission line next to other transmission lines within a designated utility corridor. All of the alternative transmission routes would have stronger visual contrasts because of line segments that do not parallel already existing transmission lines. Air quality impacts would be equal or slightly above the proposed action for all alternatives since all of the alternatives are slightly longer than the proposed transmission line route. Visual impacts from the Desert Oasis apartments would be slightly reduced by Alternatives C and D which would be further away from the apartments. Transmission Alternative Routes B and C, would have higher impacts to biological resources with more vegetation being removed with a slightly greater loss of habitat. Alternative C would cross higher quality desert tortoise habitat than other alternatives. Alternatives C and D and Subalternative E would lessen impacts on noise, since they would be farther away from sensitive receptors than the proposed project would be.

1.10.1.2 Telecommunication Alternatives

Major differences between potential impacts from the telecommunications alternatives have been identified for biological resources. The Golf Course Telecommunication Alternative would have increased potential impacts on desert tortoise habitat due to increased critical habitat acreage impacted. Greater impacts to wildlife have been identified for the Mountain Pass Telecommunication Alternative, due to the proximity of construction activities to bighorn sheep and montane bird habitats.

1.10.1.3 No Project / No Action Alternative

Under the No Project / No Action Alternative, the proposed project, including the transmission line, the proposed Ivanpah Substation, the telecommunications line, and all other components of the proposed project, would not be constructed. Therefore, none of the changes to the existing environment would occur, and there would be no adverse impact to any of the identified environmental resources. If the proposed transmission system is not developed but the planned renewable generation facilities are developed, an alternative method for connecting renewable generation facilities in the Ivanpah Valley area would need to be developed. However, because the Selected Alternative would involve only the replacement of an existing transmission line within an existing ROW, it is reasonable to assume that any alternate connection method for renewable generation facilities in the Ivanpah Valley area could result in greater impacts than the proposed project because it might require new ROW or ground disturbance in previously undisturbed areas.

2. Mitigation and Monitoring

2.1 Required Mitigation

The Eldorado Ivanpah Transmission Project (EITP) Project includes the following measures, terms, and conditions:

- Mitigation Measures from Chapter 3, Environmental Analysis, Impact Assessment and Mitigation Measure sections, in the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS), which are adopted by the Bureau of Land Management (BLM). Those measures which are adopted are listed in Appendix 4, Alternatives;
- Applicant Proposed Mitigation Measures that are contained in Chapter 3 of the FEIR/EIS;
- Terms and Conditions in the Biological Opinion that are provided in Appendix 2, Biological Opinion;
- Terms and Conditions in the Programmatic Agreement that are provided in Appendix 3, Programmatic Agreement; and
- Standard Terms, Conditions, and Stipulations (43 CFR 2800).

The complete language of these Mitigation Measures, and Applicant Proposed Mitigation will be incorporated into the applicant's final Plan of Development (POD) for the Selected Alternative. The right-of-way (ROW) will also include a Mitigation, Monitoring Compliance Reporting Program (MMCRP) that references the terms, conditions, and stipulations as shown in Appendix 4. The draft MMCRP is also included in Appendix 4.

The Mitigation Measures, Applicant Proposed Mitigation, BLM standard terms, and conditions and stipulations included in Appendix 4 are determined to be in the public interest pursuant to 43 CFR 2805.10(a)(1). A final version of the MMCRP will be made a part of the final POD that would be approved by BLM prior to the issuance of any Notice to Proceed with project construction.

2.2 Monitoring and Enforcement (40 CFR 1505.2[c])

A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation (40 CFR 1505.2[c]). Agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases. Mitigation and other conditions established in the FEIR/EIS or during its review and committed as part of the decision shall be implemented by the lead agency or other appropriate consenting agency. The lead agency shall:

- Include appropriate conditions in grants, permits or other approvals;
- Condition funding of actions on mitigation;
- Upon request, inform cooperating or commenting agencies on progress in carrying out Mitigation Measures they have proposed and that were adopted by the agency making the decision; and
- Upon request, make available to the public the results of relevant monitoring (40 CFR 1505.3).

The BLM is the federal lead agency for the EITP under the National Environmental Policy Act (NEPA). The BLM is responsible for ensuring compliance with all adopted Mitigation Measures for the EITP in the FEIS. The complete language of all the measures is listed in Appendix 4, and will be incorporated into Southern California Edison's final

POD. The final POD will be reviewed and accepted by the BLM Authorized Officer prior to the issuance of any notice to proceed for the project.

The BLM has also incorporated standard terms, conditions, and stipulations into the ROW grant. Failure on the part of Southern California Edison, as the grant holder, to adhere to these terms and conditions could result in various administrative actions up to and including suspension and even termination of the ROW grant and requirements to remove the facility and rehabilitate disturbances.

The draft MMCRP for the EITP power line is provided in Appendix 4 of this Record of Decision (ROD). The final MMCRP will also be incorporated as part of the final POD.

2.3 Mitigation Measures Not Adopted (40 CFR 1505.2[c])

There are no BLM identified Mitigation Measures from the FEIR/EIS that have not been adopted in this ROD.

2.4 Statement of All Practicable Mitigation Adopted

As required in the BLM *NEPA Handbook H-1790-1* and 40 CFR 1505.2(c), all practicable Mitigation Measures that are necessary to fully mitigate the potential effects of the project according to federal laws, rules, policies, and regulations have been adopted by this ROD for the EITP project.

3. Management Considerations

3.1 Decision Rationale

This decision approves the right-of-way (ROW) grant for the Eldorado Ivanpah Transmission Project (EITP) in accordance with the Agency Preferred Alternative (Selected Alternative) as analyzed in the Environmental Impact Report/Environmental Impact Statement (FEIR/EIS). The Bureau of Land Management (BLM) decision to authorize this transmission line ROW project is based on the rationale described in the following sections.

3.1.1 Respond to Purpose and Need

Approval of the ROW grant for the Preferred Alternative responds to BLM's purpose and need for the EITP by responding to Southern California Edison's (SCE's) application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 United States Code [USC] 1701) for a ROW grant to construct, operate, maintain, and terminate a 230-kV electric transmission line, a new substation, and other appurtenant facilities on public lands in compliance with the FLPMA, BLM ROW regulations, and other applicable federal laws.

The California Desert Conservation Area (CDCA) Plan recognized a system of ROW corridors as preferred locations for future transmission projects and the proposed project replaces an existing transmission line in a designated corridor with the new transmission line. The Las Vegas Resource Management Plan also designates ROW corridors and allows for the authorization of transmission lines on a case-by-case basis. Therefore the EITP is found to be in compliance with the existing CDCA Plan, as amended and the Las Vegas Resource Management Plan.

The construction, operation, maintenance, and termination activities associated with the Preferred Alternative, either singularly or with mitigation, are in conformance with the following land use plans and policies:

- BLM policy and guidance for issuing ROW grants, including BLM Manual 2801.11;
- ***California Desert Conservation Area Plan*** (1980, as amended), a plan amendment is required to identify the site as one used for solar generation within the CDCA;
- ***Northern and Eastern Mojave Desert Management Plan*** (NEMO) Amendment to the CDCA Plan; and
- ***Las Vegas Resource Management Plan*** (RMP) (1998, as amended), RW-1-h, all public lands within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for ROWs under the authority of the FLPMA.

The EITP Selected Alternative meets the BLM purpose and need for the project.

3.1.2 Achieve Goals and Objectives

The Selected Alternative meets all project objectives, and is technically and legally feasible. It also helps convey electricity from renewable generation projects into a state-of-the-art electric transmission grid system that helps achieve federal and state objectives for renewable energy development. The Preferred Alternative provides for the transmission of renewable energy capacity while reducing adverse impacts compared to other alternative transmission routes. The project complies with CDCA Plan objectives and Las Vegas RMP objectives.

3.2 Required Actions

The following federal statutes require that specific actions be completed prior to project implementation:

3.2.1 Endangered Species Act of 1973

Under Section 7 of the Endangered Species Act (ESA), as amended (16 United States Code [USC] 1531 et seq.), a federal agency that authorizes, funds, or carries out a project that "may affect" a listed species or its critical habitat must consult with the United States Fish and Wildlife Service (USFWS). The BLM prepared a Biological Assessment for the USFWS in accordance with Section 7 of the ESA for potential effects to the listed desert tortoise. The USFWS has issued a Biological Opinion (BO) for the project which is provided in Appendix 2, Biological Opinion, in this Record of Decision (ROD). Measures included in the BO would reduce any anticipated adverse impacts, and the BLM's issuance of a Notice to Proceed (NTP) will require that SCE comply with all reasonable and prudent measures and implementing terms and conditions listed in the BO. Furthermore, the ROW grant contains a standard stipulation that requires compliance with the BO.

3.2.2 Bald and Golden Eagle Protection Act

This Act provides for the protection of Bald and Golden Eagles by prohibiting, except under certain specified conditions, disturbance or harm of these species. To comply with the Act and based on the USFWS's recommendation (memo dated September 15, 2010, available as part of the project record), and in accordance with BLM's Instruction Memorandum 2010-156, the BLM will require SCE to develop an Avian Protection Plan (APP) prior to issuance of any NTP with construction activities. This APP may be part of an overall SCE programmatic APP and strategy to identify steps they must take system-wide to ensure eagle impacts are mitigated to the extent possible including but not limited to on-going surveys, impact monitoring, and facility design.

3.2.3 National Historic Preservation Act

The Section 106 process has been completed for the EITP. Section 106 compliance is in accordance with the Programmatic Agreement (PA, pursuant to 36 Code of Federal Regulations [CFR] 800.14[b]) executed by signature through the BLM and the California and Nevada State Historical Preservation Officers (SHPO), and other signatures in October 2010. The PA is provided in Appendix 3, Programmatic Agreement. The only property adversely affected by the EITP is the existing historic 115-kV transmission line, a part of which is being removed by the EITP project.

3.2.4 Clean Air Act as Amended in 1990

Title 40 CFR Section 51 (Subpart W–Determining Conformity of General Federal Actions to State or Federal Implementation Plans), Title 40 CFR Section 93 (Subpart B–Determining Conformity of General Federal Actions to State or Federal Implementation Plans) and 42 USC Section 7606(c), require federal actions to comply with the requirements of the Clean Air Act (CAA). The EITP is expected to meet the requirements of the CAA based on compliance. The NTP issued by the BLM is contingent upon SCE obtaining any necessary permits and compliance of the EITP with any mitigation, terms, conditions, and stipulations related to emission controls and reductions during project construction, maintenance, operation, and decommissioning, as determined by the applicable state permitting authority.

3.2.5 Clean Water Act

Section 404 of the Federal Clean Water Act (CWA) authorizes the U.S. Army Corps of Engineers (Corps) to regulate the discharge of dredged or fill materials into navigable waters of the U.S., including certain wetlands and other waters of the U.S. The Corps anticipates issuance of Nationwide Permits that will allow construction across the

Ivanpah Dry Lake and associated ephemeral washes near Primm, Nevada. There are no other jurisdictional waters of the U.S. associated with the project.

3.2.6 Incorporation of Resource Management Plan Considerations

Amendments to the CDCA Plan and the Las Vegas RMP are not required.

3.3 Legal Land Description of EITP

The following legal description applies to facilities to be authorized by CACA-49834 for a 30-year term:

Transmission Line and Access Road

San Bernardino Meridian
T. 16 N., R 14 E.
Sec. 3: lots 3 and 4, SWNW.

T. 17 N., R 14 E.
Sec. 24: SENE, SESW,SE,
Sec. 25: NWNE, N2NW, SWNW,
Sec. 26: SENE, SESW, N2SE, SWSE,
Sec. 34: SENE, SESW, N2SE, SWSE,
Sec. 35: N2NW, SWNW.

T. 17 N., R. 15 E.
Sec. 17: lot 5, S2NW, NWSW,
Sec. 18: E2SE, SWSE,
Sec. 19: lots 1, 2 and 3, NWNE, E2NW.

Mt. Diablo Meridian
T. 27 S., R. 59 E.
Sec. 3: lots 2 and 3, S2NW NWSW,
Sec. 4: SESW, SE, SENE
Sec. 9: NWSW.

T. 26 S., R. 59 E.
Sec 12: SENE, SESW, N2SE, SWSE
Sec. 13: lots 1, 4, 5, 6, and 7, NWNE,
Sec. 23: E2NE, N2SE, SWSE,
Sec. 24: lot 4,
Sec. 26: NWNE, E2NW, N2SW, SWSW,
Sec. 34: E2NE, SE,
Sec. 35: NWNW.

T. 26 S., R. 60 E.
Sec. 3: lot 4,
Sec. 4: lots 1 and 2, SWNE, SENW, N2SW,
Sec. 5: SESW, NESE, S2SE,
Sec. 7: lot 2, N2NE, SWNE, SENW,
Sec. 8: N2NW.

T. 25 S., R. 60 E.,
Sec. 24: S2SE,
Sec. 25: E2NE, SWNE, SENW, NESW, W2SW, NWSE,
Sec. 26: S2SE,
Sec. 34: SENE, NESW, S2SW, NWSE,
Sec. 35: NENE, NWNE, NENW, W2NW.

T. 25 S., R. 61 E.,
Sec. 19: SESW, SE,
Sec. 20: N2NE, SWNE, NENW, S2NW, NWSW,
Sec. 21: S2NE, NW, NESE, NWSE,
Sec. 22: S2NE, SWNW, N2SW, NWSE,
Sec. 23: S2N2, NWNE, N2NW,
Sec. 24: S2N2, N2NE,
Sec. 30: lot 1, NENW

T. 25 S., R. 62 E.,
Sec. 1: SWNW, NWSW,
Sec. 2: SENE, SW, N2SE,
Sec. 3: lots 6 and 7, SWNE, S2NW, NWSW, S2SE,
Sec. 4: E2SE, SWSE,
Sec. 8: SENE, SESW, N2SE, SWSE,
Sec. 9: NWNE, E2NW, SWNW, NWSW,
Sec. 17: N2NW, SWNW,
Sec. 18: lot 12, SWNE, SENE, SESW, N2SE, SWSE.
Sec. 19: lots 5, 6, and 7.

Overhead distribution line

San Bernardino Meridian
T. 16 N., R. 16 E.,
Sec. 28: lots 2,
Sec. 33: NWNW.

Buried Telecom Route (Redundant path outside existing Eldorado-Lugo ROW)

San Bernardino Meridian
T. 16 N., R. 16 E.,
Sec. 26: lot 5,
Sec. 28: lot 2,
Sec. 33: S2NE, SENW, NWNW,
Sec. 34: lot 3, N2NE, S2NW,
Sec. 35: lots 5 and 9, N2NW.

Mt. Diablo Meridian
T. 28 S., R. 60 E.,
Sec. 25: SENE, N2SW, N2SE,
Sec. 26: lots 8, 10, and 11.

Nipton Microwave Tower location

San Bernardino Meridian
T. 16 N., R. 16 E.,
Sec. 28: lots 2 and 3

The following legal description applies to short-term use areas authorized by CACA-49834-01 which will be granted for a three-year term.

Short-Term ROW Helicopter Landing Zones CACA-49834-01

Mt. Diablo Meridian
T. 25 S., R. 60 E.,
Sec. 24: SWSE,
Sec. 26: SWSE,
Sec. 35: NENE.

T. 25 S., R. 61 E.,
Sec. 23: NWNE, NENW.

Short-Term ROW Pull/Splice/Tension Sites CACA-49834-01

San Bernardino Meridian
T. 16 N., R. 14 E.,
Sec 3: lots 3 and 4, SWNW,
Sec. 4: lot 1.

T. 17 N., R. 14 E.,
Sec. 24: SE,
Sec. 26: NESE,
Sec. 35: NENW.

Mt. Diablo Meridian
T. 27 S., R 59 E.,
Sec. 3: lots 3 and 4, SENW.

T. 26 S., R 59 E.,
Sec. 12: N2SE,
Sec. 26: SENW, NESW,
Sec. 34: SENE, NESE.

T. 26 S., R. 60 E.,
Sec. 4: S2NW, N2SW,
Sec. 7: SENW.

T. 25 S., R. 60 E.,
Sec. 26: S2SE,
Sec. 35:NWNE.

T. 25 S., R. 61 E.,
Sec. 20: SWNE, S2NW,
Sec. 22: S2SW,
Sec. 24: E2NE.

T. 25 S., R 62 E.,
Sec. 1: SWNE, NWSW,
Sec. 2: SENE, E2SW, N2SE, SWSE,
Sec. 3: lot 6, SESE,
Sec. 17: SWNW,
Sec. 19: lot 7.

3.4 Statement of No Unnecessary or Undue Degradation (43 USC 1732[b])

Congress declared that the public lands be managed for multiple use and sustained yield, in a manner to protect certain land values, to provide food and habitat for species, and to provide for outdoor recreation and human occupancy and use (43 USC 1701 [a][7], [8]). Multiple use management means that public land resources are to be managed to best meet the present and future needs of the American public, balanced to take into consideration the long-term needs of future generations without permanent impairment of the lands (43 USC 1702[c]). BLM manages public land through land use planning, acquisition, and disposition, and through regulation of use, occupancy, and development of the public lands (Subchapters II and III, respectively, 43 USC 1711 to 1722, and 1731 to 1748).

The FLPMA specifically provides that in "managing public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands" (43 USC Section 1781[b]). The process for siting and evaluating the EITP has included extensive efforts on the part of BLM, SCE, the California Public Utilities Commission, public commentors, and other agencies in order to identify a project that accomplishes the purpose and need and other project objectives, while preventing any unnecessary or undue degradation of the lands. These efforts have included:

- The siting of the proposed facility inside existing designated Utility Corridors, and maximizing use of lands that have not been specifically designated for the protection of any resources.
- The selection of an alignment that maximizes the use of existing ROW grants currently held by the applicant.
- The evaluation of project location alternatives which could meet the purpose and need for the proposed project, but result in the avoidance and/or minimization of impacts.
- The development of mitigation measures, including compensation requirements for the displacement of desert tortoise habitat, to further avoid or minimize impacts.

In addition, BLM ROW regulations at 2805.11(a)(1) to (5) require determinations for the following:

BLM will limit the grant to those lands which BLM determines:

(1) You will occupy with authorized facilities;

(2) Are necessary for constructing, operating, maintaining, and terminating the authorized facilities;

(3) Are necessary to protect the public health and safety;

(4) Will not unnecessarily damage the environment; and

(5) Will not result in unnecessary or undue degradation.

The lands described above are the minimum necessary to accommodate the transmission project. The applicant has identified and proposes to utilize previously disturbed access routes and disturbed areas within their existing ROW to the extent feasible to minimize the needs to disturb additional areas. All temporary disturbances associated with overhead and underground utilities will be immediately restored and revegetated to minimize erosion in accordance with approved restoration and revegetation plans. Public health and safety will not be compromised by the project as construction work areas will be posted and public access to those areas controlled to prevent possible injury to the public.

The Selected Alternative will achieve almost all of the beneficial impacts of the proposed project, including socioeconomic benefits of increases in employment and fiscal resources, and displacement of greenhouse gas and air pollutant emissions that are reduced and minimized with renewable energy generation. Based on the comparative analysis of the ability of each alternative to meet the purpose and need, and the environmental impacts that would be associated with each alternative as discussed in the FEIS and as summarized above, the Proposed Action was identified by BLM as the Preferred Alternative, and is the Selected Alternative in this ROD. The Selected Alternative does not unnecessarily damage the environment or create unnecessary or undue degradation of the lands.

3.5 Statement of Technical and Financial Capability (43 USC 1764[j])

The CFR provides federal agencies the authority to require a project application to include information on an applicant's technical capability to construct, operate, and maintain the solar energy facilities applied for (43 CFR 2804.12[a][5]).

This technical capability can be demonstrated by other domestic experience with similar transmission facilities. The applicant has provided information on the availability of sufficient capitalization to carry out development, including the preliminary study phase of the project, as well as the site testing and monitoring activities. SCE is an electric utility with both Transmission and Distribution service divisions. SCE operates hundreds of miles of existing Transmission lines in the southwestern U.S.

The applicant's statement of technical and financial capability is provided in their ROW applications for the project.

3.6 Relationship to BLM and Other Agency Plans, Programs, and Policies

3.6.1 Tribal Consultation

The BLM conducted government-to-government consultation with a number of Tribal governments and Tribal representatives as described in detail in Section 3.5.1.4, Tribal Consultation, in the FEIS. The consultation with Native American Tribes and the discussions with Tribal organizations and individuals revealed few concerns or interest in the EITP.

The following contacts were made with all tribes identified that would be associated with lands proposed for the facility. No specific concerns were expressed by any of the Tribes consulted. Although information was requested, no sites of traditional or religious use were identified in the area by the Tribes. Numerous letters as well as phone calls and face-to-face meetings occurred with Tribes on this project:

- Letter #1 (September 17, 2009): Initiated coordination/consultation with results of archaeological survey.

- Letter #2 (May 11, 2010): Letters to tribes continuing our government-to-government consultation and transmitting Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS).
- Letter #3 (November 29, 2010): Mailed tribes a copy of the FEIR/EIS.

BLM did not receive any calls, contacts, or correspondence from any of the tribes potentially affected by the project. In accordance with 36 CFR Part 800.14(b), PAs are used for the resolution of adverse effects for complex project situations and when effects on historic properties (resources eligible for or listed in the National Register of Historic Places [National Register]) cannot be fully determined prior to approval of an undertaking. The BLM developed and executed a PA regarding the Historic Lattice Steel Tower Transmission Lines for the EITP, however, the PA was limited in scope to the transmission line. It was determined that potentially affected tribes would not be interested in this historic power transmission line. The project did not affect other cultural resources sites requiring mitigation of impacts.

3.6.2 USFWS Section 7 Consultation

The BLM permit, consultation, and coordination with the USFWS required for the EITP complies with the federal ESA regarding potential take of the desert tortoise, which is listed as a threatened species. The BLM submitted a Biological Assessment (BA) for take of desert tortoise to the USFWS for the Ivanpah Solar Electric Generating System project on August 9, 2010.

The BO was issued by USFWS on April 29, 2011. In the BO, the USFWS conducted analysis of the impact of the Selected Alternative on the desert tortoise and its habitat, including:

- Scope of the proposed action;
- Environmental baseline, including evaluation of habitat characteristics and estimation of the number of tortoise present by various methods;
- Status of the tortoise populations in the area;
- Impacts due to construction, operations, and restoration;
- Impacts due to loss of habitat; and
- Compensation measures.

In the BO, the Service determined that the level of anticipated take will not jeopardize the continued existence of the desert tortoise, stating:

> "Our evaluation of the proposed action includes consideration of the protective measures described in the *Description of the Proposed Action* section of the accompanying biological opinion. Consequently, any changes in these protective measures may constitute a modification of the proposed action that causes an effect to the desert tortoise that was not considered in the biological opinion and requires reinitiation of consultation, pursuant to the implementing regulations of the section 7(a)(2) of the Act (50 CFR § 402.16)."

In addition, this conclusion was reached for a variety of reasons, including:

1. The number of desert tortoises injured and killed as a result of the project will likely be small relative to the number of desert tortoises that occur within the Northeastern Mojave Recovery Unit, and across the range of the species.

2. SCE will implement numerous measures to reduce the potential for increased predation by common Ravens and the spread of non-native plant species.
3. This project would not result in loss of desert tortoise habitat in areas that the Bureau or other agencies have designated for intensive management to achieve conservation of desert tortoises.
4. Compensation requirements through the BLM and the California Department of Fish and Game, and in Nevada renumerations made to the BLM and Clark County Desert Conservation Program, will result in an increase in the amount of existing habitat that is managed for the conservation of the desert tortoise and will likely lead to restoration of lost or degraded habitat within these areas.

The ROD incorporates the results of the BO, including a condition of approval requiring the applicant to comply with the reasonable and prudent measures and required terms and conditions. The BO is provided in Appendix 2, Biological Opinion, of this ROD. It is also available on the BLM website.

3.6.3 Bald and Golden Eagle Protection Act

The BLM coordinated with USFWS concerning requirements of the Bald and Golden Eagle Protection Act. In order to comply with the Act, and based on the USFWS recommendation (memo dated September 15, 2010, available as part of the project record), the BLM will require the preparation of an Avian Protection Plan (APP) prior to issuance of an NTP for the project (see MM-BIO 18 and stipulations). The applicant is considering whether to approach this requirement on a programmatic basis for all of their transmission system or if a project specific APP will be prepared for the EITP.

3.6.4 Section 106 and the Programmatic Agreement

The BLM prepared a PA for the EITP in consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officers (SHPO) in Nevada and California, and other interested parties. The executed Final PA, provided in Appendix 3 of this ROD, will govern the required mitigation for the adverse effect to the historic 115-kV transmission line, previously determined eligible for inclusion on the National Register of Historic Places. Required mitigation, such as the development of a Historic American Engineering Record study to document this important resource, provides an opportunity to minimize the effects of the project on cultural resources in accordance with the National Historic Preservation Act.

3.7 Consultation with Other Federal Agencies

The County of Clark, Nevada, cooperated with the BLM on the FEIS for the Ivanpah Solar Electric Generating System project. Input was received from the Clark County Department of Aviation and the Desert Conservation Program. In addition, the Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), National Park Service (NPS), and the U.S. Army Corps of Engineers (Corps) provided input to the BLM on the project and the EIS. Comments received from these agencies on the DEIS were addressed in the comment response appendices of the FEIS. This appendix explains which comments were incorporated into the FEIS. Appendix 1 of this ROD contains further comments from Clark County, EPA, and BLM's responses.

3.7.1 Clark County, Nevada

The Clark County Department of Aviation provided comments and review of the DEIR/EIS because of their concerns related to the proposed Southern Nevada Supplemental Airport (SNSA). The EITP corridor crosses a segment of lands identified in P.L. 105-263, Sec. 42(g), as the Airport Environs Area, a 17,000 acre area that could be transferred to the Clark County Department of Aviation if requested, whenever the SNSA is approved. The SNSA is still in the planning stages but is on hold at the current time. Mitigation Measure (MM Haz-2) requires SCE to comply

with any FAA requirements upon completion of the SNSA. The Clark County Desert Conservation Program also provided input and comments throughout the project relating to segments of the proposed project that crosses patented lands currently owned by the town of Boulder City that are overlaid by a conservation easement that limits development. On lands within the conservation easement, SCE will construct the new transmission project within the boundaries of their existing ROW to eliminate additional surface disturbing activities.

3.7.2 Nevada Department of Wildlife

The Nevada Department of Wildlife (NDOW) provided comments during agency scoping expressing concerns with construction activities during big horn sheep lambing periods. MM BIO-13 will be implemented to reduce potential impacts to big horn sheep by not constructing in lambing areas between January and May in the McCullough Pass area, and by monitoring all construction activities for the presence of sheep and stopping construction when sheep are found within 500 feet of the construction area. NDOW also expressed verbal communications recommending tubular steel pole designs to reduce Raven nesting and predation issues for juvenile desert tortoises. The applicant has prepared a Raven management plan per requirements in MM BIO-12 that will monitor and control offending Ravens if found on the ROW.

3.7.3 United States Environmental Protection Agency

The EPA provided written comments on the proposed project and the EIS preparation during the scoping period. The EPA also provided written comments related to the projects impacts to waters of the United States during the review period for the Draft and Final EIS. Responses to the comments on the Final EIR/EIS are provided in Appendix 1.

3.7.4 Federal Aviation Administration

The FAA provided written comments on the proposed project and the EIS preparation during the scoping period. The comments regarded potential effects of the project on the planned SNSA. Mitigation Measure (MM Haz-2) requires SCE to comply with any FAA requirements upon completion of the SNSA.

3.7.5 National Park Service

The NPS provided written comments on the proposed project and the EIS preparation during the scoping period. The applicants proposed action for the telecommunication pathway was modified early based on NPS input so as to completely avoid the Mojave National Preserve.

3.7.6 Unites States Army Corps of Engineers

The Corps was contacted during the NEPA process. The applicant prepared a delineation of waters of the United States and submitted the delineation to the Corps. The Corps visited the site and participated in conference calls and provided verbal feedback that the project would fall under a Nationwide Permit.

3.8 Land Use Plan Conformance (43 CFR 1610.5-3[a])

3.8.1 California Desert Conservation Area Plan

The FLPMA establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. The FLPMA specifically establishes BLM's authority to grant ROWs for the generation, transmission, and distribution of electrical energy as follows:

(a) The Secretary, with respect to the public lands ... are authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands for:

(4) systems for generation, transmission, and distribution of electric energy

The FLPMA is relevant to the EITP because it establishes BLM's authority to grant ROWs on public lands for the generation, transmission, and distribution of electrical energy. Because the FLPMA authorizes the issuance of a ROW grant for electrical generation facilities and transmission lines, the EITP will be consistent with the FLPMA.

The CDCA Plan was developed as mandated by the FLPMA and is the land use plan for the EITP site and the surrounding area within the defined CDCA. The CDCA Plan is a comprehensive, long-range plan for the management, use, development, and protection of the public lands in the CDCA. The 25-million acre CDCA contains over 12 million acres of public lands in the California desert, which includes the Mojave Desert, the Sonoran Desert, and a small part of the Great Basin Desert. Those 12 million acres of public lands are approximately half of the total land area in the CDCA. The site proposed for the EITP includes approximately 7 miles of transmission line, a substation, 3 miles of redundant telecommunications line, several miles of 33-kV distribution line, and a microwave tower in the CDCA administered by the BLM.

Goals and actions for each resource managed by the BLM are established in the 12 Elements in the CDCA Plan. Each Plan Element provides a Desert-wide perspective of the planning decisions for one major resource or issue of public concern as well as more specific interpretation of multiple use class guidelines for a given resource and its associated activities.

The EITP project site is classified in the CDCA Plan as Multiple Use Class (MUC) L (Limited Use). MUC L, the most restrictive multiple use classification in the Plan, "...protects sensitive, natural, scenic, ecological, and cultural resource values." Public lands designated Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished. However, the lands are also listed in the CDCA Plan under the Energy Production and Utility Corridor Element, which designates a regional network of utility planning corridors. Within California, the proposed project would replace an existing ROW within established energy corridors that allow for electrical transmission of 161-kV and above. The CDCA Plan notes that utility planning corridors specifically address the expansion of utility facilities constructed for the purpose of telecommunications and bulk transfers of electricity, gas, water, petroleum, and other commodities. Expansion is defined in the element as the addition, construction, or major modification of a tower, pipe, or cable to accommodate the transfer of additional products. The EITP fits within the definitions of expansion of utility facilities and for implementing the Utility Corridor Element that states, applications for utility ROWs will be encouraged by BLM management to use designated corridors. Even though the project lands are classified as class "L," because the EITP transmission line is within an existing transmission corridor identified in the CDCA Plan, no plan amendment is required (CDCA Plan, p.95).

3.8.2 Las Vegas Resource Management Plan

The EITP segments located in Nevada on public land are in conformance with the Las Vegas RMP ROD as it states that all public lands within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for ROWs under the authority of the FLPMA. Nevada is also within established energy corridors that have been designated in the Plan.

3.8.3 Need for a Plan Amendment

No plan amendments are required to approve the EITP in either California or Nevada.

3.9 Adequacy of NEPA Analysis

The BLM considered the need for a Determination of NEPA Adequacy (DNA) worksheet to evaluate new circumstances and information that emerged after publication of the FEIR/EIS to determine whether or not a supplemental NEPA analysis was required. Use of the DNA worksheet for this purpose would be consistent with guidance in Section 5.1 of the agency's NEPA Handbook H-1790-1. The applicant has not submitted any changes to the project since the publication of the FEIS that would suggest a DNA worksheet is required and the BLM has determined that no supplementation under NEPA is required.

4. Alternatives (40 CFR 1505.2[b])

The Selected Alternative includes the following components:

Powerlines

- **Eldorado–Ivanpah Transmission Line:** A new double-circuit 230-kV transmission line, approximately 35 miles long, would be constructed between the existing Eldorado Substation in Nevada and the proposed Ivanpah Substation in California. It would replace a portion of the existing 115-kV transmission line that runs from Eldorado to Mountain Pass, through Baker, Dunn Siding, and Cool Water Substations[1]. The existing 115-kV transmission line that runs west of the proposed Ivanpah Substation to Mountain Pass Substation would remain unchanged and is not part of the proposed project.
- **Subtransmission Line:** A proposed 600- to 800-foot-long addition to an existing 115-kV subtransmission line from a connection point would connect the remaining portion of the existing Eldorado–Mountain Pass--Baker–Cool Water–Dunn Siding 115-kV line with the proposed Ivanpah Substation.
- **Distribution Lines:** A proposed 33-kV distribution circuit, consisting of approximately 5,200 feet of new underground facilities and 5,900 feet of overhead lines, would be constructed to provide light and power to the proposed Ivanpah Substation. Approximately 400 feet of new 33-kV distribution line would be constructed underground to provide light and auxiliary power to the proposed Ivanpah Substation. In addition, the new distribution circuit includes a new 4,300-foot segment of 33-kV overhead lines, and a new underground service from the existing Nipton 12-kV distribution line would be built to provide power to a proposed microwave telecommunications site in the Ivanpah Substation. Near the town of Nipton, California, a buried distribution line would provide electric service to the Nipton Microwave relay.

4.1 Alternatives Fully Analyzed in the Draft EIR/EIS

This section summarizes alternatives that were carried forward for analysis in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS), including the No Project Alternative. The alternatives that were eliminated from detailed consideration in the EIR/EIS along with the rationale for elimination are found on pages 2-65 to 2-68 in the Final EIR/EIS.

4.1.1 Transmission Line Routing Alternatives

The alternatives carried forward for analysis that were minor route variations to the proposed transmission line route are called the Transmission Alternatives (Figure 2-1, Appendix 5). Two of the Transmission Alternatives are near the existing Eldorado Substation and are designed to avoid an area not designated as a Bureau of Land Management (BLM) utility corridor. Although this area contains the right-of-way (ROW) for the existing 115-kV line, it falls outside of a reserved BLM-designated corridor, therefore, Southern California Edison (SCE) must obtain Clark County and City of Boulder approval to widen the ROW to the 100 or 130 feet required for the upgraded 230-kV line. The two alternative transmission routes were designed to parallel existing transmission ROWs within the BLM reserved designated ROW corridors.

The other three transmission minor route alternatives are near Primm, Nevada, and are designed to avoid potential impacts to Ivanpah Dry Lake. All the Transmission Alternatives diverge from the proposed transmission line route for a portion of the route, but are not an entire project alternative.

[1] The Public Utilities Commission of Nevada (PUCN) has determined that the replacement of an existing facility with a similar facility does not constitute construction of a utility facility (NRS 704.865).

1. Parallel to LADWP Line Segment (Transmission Alternative Route A)

The Eldorado–Ivanpah 230-kV Transmission Alternative Route A (Figure 2-1, Appendix 5) would begin at the Eldorado Substation. The line would leave the substation heading north, and then immediately would head west to join the existing Eldorado–Mountain Pass–Baker–Cool Water–Dunn Siding ROW. The line would proceed generally west on a 130-foot ROW and cross three Los Angeles Department of Water and Power (LADWP) transmission lines (McCullough–Victorville No. 1, 500-kV; McCullough– Victorville No. 2, 500-kV; and Mead–Victorville, 287-kV) to the north before heading west again. The route would then cross the LADWP 500-kV transmission line (Marketplace–Adelanto). Transmission Alternative Route A would continue west for approximately 5.0 miles on a new ROW, and then turn north for approximately 1,000 feet before crossing the LADWP Marketplace–Adelanto 500-kV transmission line again and joining the proposed project route at MP 7.

The purpose of this alternative is to bypass the 0.8 mile segment of the proposed project route where the proposed project would deviate from designated transmission corridors that are managed by BLM.

2. North of Eldorado (Transmission Alternative Route B)

Transmission Alternative Route B (Figure 2-1, Appendix 5) would begin at the Eldorado Substation. The line would exit the substation to the north and parallel the Eldorado–Mead 230-kV transmission line on existing ROW for approximately 2.5 miles before turning southwest. The route would continue southwest for approximately 2.8 miles and re-join the existing Eldorado–Mountain Pass–Baker–Cool Water–Dunn Siding 115-kV transmission line ROW at MP 2 of the proposed route. This alternative would require numerous, difficult transmission crossings, and several of these overhead utility lines would require modification or relocation to accommodate passage of the Transmission Alternative Route B transmission line.

Similar to Transmission Alternative Route A, the purpose of Transmission Alternative Route B is to bypass a segment of approximately 0.8 miles where the proposed project would deviate from existing BLM managed designated transmission corridor and would cross lands administered by the City of Boulder (Boulder City Conservation Easement).

3. North Dry Lakes Reroute (Transmission Alternative Route C)

Transmission Alternative Route C (Figure 2-1, Appendix 5) would begin at the Eldorado Substation and follow the proposed route to the point where the line reaches the northeastern edge of the Ivanpah Dry Lake (MP 27, tower 185). Transmission Alternative Route C would then continue west and southwest on a new 130-foot ROW around Ivanpah Dry Lake for approximately 5.3 miles before rejoining the proposed project route at MP 32, tower 218. Transmission Alternative Route C was developed to minimize potential impacts to the Ivanpah Dry Lake.

4. South Dry Lakes Reroute (Transmission Alternative Route D)

Transmission Alternative Route D (Figure 2-1, Appendix 5) would parallel the existing LADWP Marketplace–Adelanto 500-kV transmission line as it crosses through the Ivanpah Dry Lake. This route would reduce the overall transmission footprint, since the EITP towers would follow, to the extent feasible, the existing LADWP 500-kV ROW. Transmission Alternative D begins at the Eldorado Substation and follows the proposed route until it approaches the northeastern edge of the Ivanpah Dry Lake (MP 27, tower 184). Transmission Alternative D would then continue south and then southwest on a new 130-foot ROW around Primm for approximately 3.3 miles before rejoining the proposed project route at MP 30, tower 203.

5. South Dry Lakes Bypass (Transmission Subalternative Route E)

Transmission Subalternative Route E is a subalternative to Transmission Alternative Route D. Subalternative E would use a shorter length of new 130-foot ROW (approximately 0.25 miles shorter than Alternative D) from MP 27 of the proposed EITP transmission line to the corridor that would parallel the existing LADWP Marketplace–Adelanto 500-kV transmission line. As would Transmission Alternative D, this route would reduce the overall transmission

footprint, since the EITP towers would follow, to the extent feasible, the existing LADWP 500-kV ROW. Transmission Subalternative Route E would proceed south from MP 27 for approximately 1 mile and then follow the route proposed for Transmission Alternative D (Figure 2-12, Appendix 5).

4.1.2 Telecommunication Alternatives

In addition to minor transmission line routing alternatives, the Final EIR/EIS analyzes two telecommunication alternatives to the proposed telecommunication system. These are the Golf Course Telecommunication Alternative and the Mountain Pass Telecommunication Alternative. These alternatives include additional underground segments and installation of telecommunication wires along existing distribution lines to minimize potential visual impacts of an aboveground microwave tower.

1. Telecommunication Alternative (Golf Course)

The Golf Course Telecommunication Alternative route would extend from Nipton to the point on the north side of Nipton Road where it intersects with Interstate-15 (I-15). This alternative would consist of a combination of all-dielectric self-supporting fiber cable installed on existing Nipton 33-kV wooden distribution pole lines and underground fiber optic cable in new duct banks (Figure 2-13, Appendix 5). Approximately 1 mile of all-dielectric self-supporting fiber cable would be installed overhead on an existing Nipton 33-kV distribution line immediately west of Nipton, on the north side of Nipton Road. Pole replacement for this alternative is not anticipated; however, the detailed project engineering design process might indicate that pole replacement would be necessary. From the westernmost pole on the Nipton line before it crosses to the south side of Nipton Road, fiber optic cable would be installed in a new underground duct along the north side of Nipton Road in new ROW to the intersection of Nipton Road and I-15. The underground cable length for this segment would be approximately 9 miles.

From the I-15–Nipton Road junction, the Golf Course Telecommunication Alternative route would parallel I-15, running north on an existing Nipton 33-kV distribution line, and crossing I-15 near the Primm Valley Golf Course. This alternative route would cross the Primm Valley Golf Course in a new underground duct (Figure 2-13, Appendix 5), then continue on an existing Nipton 33-kV distribution line to a point approximately 1 mile north of the Ivanpah Substation. The telecommunication line would then be installed in a new underground duct for approximately 1 mile to the Ivanpah Substation. The entire route from the I-15 junction to the Ivanpah Substation would be approximately 10 miles.

2. Telecommunication Alternative (Mountain Pass)

The Mountain Pass Telecommunication Alternative route would extend from Nipton to the point on the north side of Nipton Road where it intersects with I-15. This alternative would consist of all-dielectric self-supporting fiber cable installed on existing Nipton 33-kV wooden distribution pole lines and in an underground fiber optic in new duct as described in the Golf Course Telecommunications Alternative.

From the I-15 junction point with Nipton Road, the route would parallel I-15 in an underground duct for approximately 1.0 mile and then would exit the underground duct and be strung on an existing Nipton 33-kV distribution line. The alternative route would then continue west to the town of Mountain Pass, then north to the Mountain Pass Substation. From there, the cable route would proceed northeast on an existing Nipton 33-kV distribution line to the Ivanpah Substation. The route would enter the proposed Ivanpah Substation from the south via approximately 500 feet of underground conduit that would be installed from the last Nipton 33-kV distribution line pole to the substation. The Mountain Pass Telecommunication route, from the I-15 junction point to the Ivanpah Substation, would be approximately 15.0 miles.

Dedicated communication enclosures would be included within the Mountain Pass Substation (6.0 miles southwest of the Ivanpah Substation) to house communication equipment. The communication equipment would be needed to repeat (re-generate) optical signals from/to Eldorado via telecommunication Path 2, Section 3. The enclosures would

be equipped with an AC electrical power interface, batteries and battery chargers, air conditioners, and conduits for connection to fiber optic cables from distribution pole lines.

4.1.3 No Project / No Action Alternative

The No Project Alternative / No Action alternative considers the environmental impacts if the proposed project and its alternatives are not built. Under this alternative, none of the activities or potential environmental impacts described in Chapter 3 of the Final EIR/EIS would occur. For the California Public Utilities Commission (CPUC), a No Project decision would be the denial of the Certificate of Public Convenience and Necessity application filed by SCE. The BLM No Action decision would be the denial of the ROW application filed by SCE.

Under the No Project / No Action alternative, the objectives of the proposed project would not be accomplished. The electrical transmission system proposed to connect renewable energy sources in the Ivanpah Valley area would not be constructed. Therefore, the applicant and other California utilities might not be able to comply with the provisions of Executive Order 13212, the Energy Policy Act of 2005, the Federal Power Act, California Senate Bill 1078, or California Senate Bill 107.

The applicant would continue to operate and maintain the existing 115-kV transmission structures and the existing Eldorado Substation. The applicant would also continue to use existing access and spur roads for operations and maintenance. The applicant is required to interconnect and integrate power generation facilities into its electric system, under Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 [i] and [k]) and Sections 3.2 and 5.7 of the California Independent Service Operator's (CAISO's) Tariff. Further, state mandates require the applicant to increase its percentage of renewable generation sources in its overall energy portfolio. The existing transmission system in the Ivanpah Valley area cannot support the interconnection of these renewable generation projects planned for the area. With the proposed transmission system, the applicant would be able to connect some of the planned renewable generation projects in the Ivanpah Valley area to the existing CAISO-controlled grid, which would help the applicant meet the renewable generation goals set by the state.

Under the No Project Alternative / No Action, the following events or actions (scenarios) related to electric generation and transmission could be reasonably expected to occur in the foreseeable future:

- As currently conceived, solar projects proposed in the Ivanpah Valley area would be postponed or cancelled.
- Applicants for certain projects planned in the area have stated their intention to connect to an upgraded 230-kV transmission network, and it can be reasonably assumed that other planned projects in the area have the same intention. These proposed renewable energy projects would have to find alternate means to connect to the existing transmission system without compromising system reliability.
- The California Renewable Portfolio Standard (RPS), which requires retail sellers of electricity to increase their sales share produced by renewable energy sources to 20 percent by 2010, might not be achieved without access to renewable energy from the Ivanpah Valley. While access to renewable energy from the Ivanpah Valley could be provided via other methods, the location of the existing SCE transmission corridor in relation to the planned renewable generation projects in the Ivanpah Valley area make it a likely candidate for providing access to the CAISO-controlled grid.
- Other renewable energy resources would need to be identified and transmission studies would need to be conducted to connect these newly identified sources to the transmission grid. This could delay SCE's, and other utilities', ability to reach the RPS goal of 20 percent renewable generation sources by 2010.
- If the proposed transmission system is not constructed, the planned renewable generation facilities would need to find alternative means for transmitting their power to load centers and customers. This alternative

might not meet the objectives outlined by the CPUC and the BLM. Specifically, under the No Project Alternative, access to the CAISO-controlled grid might, but might not, be provided to solar generation projects planned for the Ivanpah Valley area, because these projects might not be constructed or could connect to transmission systems that service customers outside of California.

- Under the No Project Alternative, the applicant would need to identify alternate renewable generation sources to meet the state RPS goals. This could result in delaying the applicant's ability to comply with the RPS mandate and, depending on the alternate sources identified, could result in greater environmental impacts than the proposed project as they might require creation of a new ROW or might require ground disturbance in previously undisturbed areas.
- Further, if the proposed transmission system is not developed but the planned renewable generation facilities are developed, an alternative method for connecting renewable generation facilities in the Ivanpah Valley area would need to be developed.

4.2 Agency Preferred Alternative

The BLM identified the Proposed Action as the Agency Preferred Alternative in the Draft EIR/EIS in Section 2.3.4. The CPUC also identified the Proposed Project (Proposed Action) as the California Environmental Quality Act Environmentally Superior Alternative. The Final EIR/EIS contained the same findings and stated the Record of Decision would identify the National Environmental Policy Act (NEPA) environmentally preferred alternative.

4.3 Environmentally Preferable Alternative

The "environmentally preferable alternative," is the alternative that would promote the national environmental policy, as expressed in NEPA Section 101. Ordinarily, this means the alternative that would cause the least damage to the biological and physical environment; however, it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. The environmentally preferable alternative is identified as the Selected Alternative for the following reasons:

- The Selected Alternative maximizes the use of designated ROW utility corridors and overlaps with existing ROW grants held by the applicant. Using previously disturbed lands and existing ROW will minimize physical damage and surface disturbance.
- The Selected Alternative utilizes a microwave link for the redundant telecommunications pathway that avoids disturbing additional lands that would be required to string the telecommunications via a hard wire connection described in the Alternatives.

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5. Agency and Public Involvement

The agency and public involvement processes for the Eldorado Ivanpah Transmission Project (EITP) focused on two main processes: scoping and comments on the Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS).

5.1 Scoping

The scoping process for the EITP EIR/EIS consisted of the following four main elements:

1. Publication of the Notice of Intent (NOI) to prepare an EIS published in the Federal Register on July 27, 2009, initiated a formal public scoping process.
2. Establishment of public information repositories for scoping and project documents, including a website and an electronic mail address for comments.
3. Hosting of two public scoping meetings, one in Primm, Nevada, on July 28, 2009, and a second in Las Vegas, Nevada, on July 29, 2009. Additionally an inter-agency consultation meeting was held in advance of the public scoping meetings on July 1, 2009. Representatives from the Federal Aviation Administration; Mojave National Preserve; United States Fish and Wildlife Service; California Department of Fish and Game; California Department of Transportation; Nevada Division of Wildlife; Clark County Department of Aviation; Clark County Department of Planning; Clark County Desert Conservation Program; Boulder City, Nevada; and the Town of Laughlin, Nevada, Manager's Office.
4. Documentation of all public and agency comments received in a Scoping Summary Report.

The public scoping process was intended to allow the public, interested parties, and regulatory agencies an opportunity to comment on the scope of the EIR/EIS and to identify issues that should be addressed in the document. Federal, state, regional, and city agencies; Native American tribes and communities; businesses; and interested groups and individuals were given the opportunity to participate in the scoping process by providing comments and recommendations at the scoping meetings or via the EITP scoping comment repositories.

After deciding that an EIR/EIS was needed, both the state and federal lead agencies were required to prepare and distribute a notice informing interested parties that an EIR or EIS, respectively, will be prepared. The California Environmental Quality Act (CEQA) requires that the state lead agency prepare a Notice of Preparation (NOP), and the National Environmental Policy Act (NEPA) requires that the federal lead agency prepare an NOI.

Pursuant to the state and federal requirements discussed above, an NOP and an NOI were distributed for the EITP. The California Public Utilities Commission (CPUC) provided an NOP to the California State Clearinghouse for release on July 23, 2009. The NOP was mailed to 133 government agencies, as well as 96 residents and nongovernmental organizations to inform the public of the proposed project and provide notice of the public scoping meetings. The Bureau of Land Management (BLM) published an NOI for NEPA in the Federal Register on July 27, 2009, but did not duplicate the mailing to those that received the NOP since the meeting information and timing were identical for both notices.

The NOP and NOI were provided as an appendix to the Scoping Summary Report in Appendix E of the EIR/EIS.

5.2 Scoping Meetings

CEQA recommends that public scoping be combined to the extent possible with consultation with responsible agencies, as required under 14 California Code of Regulations 15802. Consultation is conducted with agencies that will be involved in the environmental review process locally, as well as state and federal agencies and tribal governments, as appropriate.

Therefore, the CPUC and the BLM conducted joint public scoping meetings along the proposed route in Nipton, California, on Tuesday, July 28, 2009, and in Las Vegas, Nevada, on Wednesday, July 29, 2009. The format for the scoping meetings included an open house, a PowerPoint presentation describing the EITP, and an opportunity to provide verbal or written comments. Approximately three people attended the meeting at the Primm Valley Golf Club, and approximately seven people attended the Las Vegas meeting. No formal comments were submitted in either of the scoping meetings.

Four primary areas of concern were identified during the public scoping process: (1) impacts of the project on several biological resources, especially desert tortoise; (2) compatibility with regional land uses such as the planned Southern Nevada Supplemental Airport; (3) compatibility with other existing right-of-way designations; and (4) cumulative impacts.

5.3 Draft EIS and Public Comment Period

A 45-day public comment period for the DEIR/EIS was initiated between April 30, 2010, and June 26, 2010. The NOA described information regarding the 45-day public review period and included notice of public meetings. The purpose of the DEIR/EIS public hearings/meetings was to inform the public about the project's environmental effects, describe alternatives to the proposed action under consideration in the decision-making process, and provide interested parties with an opportunity to submit oral and written comments to the DEIR/EIS.

The CPUC and the BLM conducted joint public comment meetings along the proposed route in Nipton, California, and Las Vegas, Nevada, on Wednesday, May 26, 2010. The format for the public meetings included a PowerPoint presentation describing the findings of the environmental analysis. Comment cards were provided to encourage public verbal or written comment to the DEIR/EIS and informational sheets about environmental impacts of the proposed project were made available to the public at each venue. Each public meeting included presentations by the CPUC and the BLM describing the purpose and preparation stages of the EITP EIR/EIS under the CEQA/NEPA process followed by a description of other local and state entities which contributed to the preparation of the document.

Comments on the DEIS ranged from requests for clarification on the applicant's project description to requests for additional resource-specific information for several resource sections (e.g., air quality, biology, hazards and safety, and land use), comments on the Whole of the Action / Cumulative Action approach, and comments on the range of project alternatives. Comments were received from the following governmental entities:

- U.S. Environmental Protection Agency;
- California Department of Fish and Game;
- California Department of Transportation;
- California Department of Toxic Substances Control;
- California State Lands Commission;
- Clark County Department of Aviation;

- Mojave Desert Air Quality Management District; and
- Nevada Department of Wildlife.

Comments were received from the following interested parties:

- BrightSource Energy;
- Center for Biological Diversity, San Francisco Office;
- Desert Conservation Program;
- Powers Engineering;
- Sierra Club;
- Southern California Edison; and
- Western Watersheds Project

A list of the persons and agencies that were consulted during the preparation of the EIS is listed on pages 7-6 and 7-7 of the Final EIR/EIS (FEIR/EIS). In addition, responses to all comments received on the DEIS are contained in Appendix G of the FEIS. This appendix provides a copy of the original comment letter along with responses to the issue raised in the comment.

5.4 Final EIS

The U.S. Environmental Protection Agency published a Notice of Availability (NOA) of the FEIS on December 17, 2010. The BLM's NOA appeared in the Federal Register on December 21, 2010. The FEIR/EIS was distributed to a variety of federal, State, local government agencies, and Native tribal governments, and notices describing how to obtain the document were sent to other interested parties. The CPUC posted the FEIR/EIS on their project website in early November 2010 as part of the CPUC decision process. Five parties have provided BLM with comments on the FEIS. Those comments and responses to them are included in Appendix 1 of this Record of Decision (ROD).

BLM also distributed a news release about the NOA in the local and regional media. BLM will publish an NOA announcing the availability of this ROD along with further local and regional media announcements. The ROD will be available on BLM websites and hard copies or CDs will be provided upon request.

5.5 Summary of Consultation with Other Agencies and Entities

The BLM and the right-of-way applicant have been consulting and coordinating with public agencies that may be requested to take action on the EITP and other interested parties as part of one or more of the following project phases: planning, scoping, public review of the DEIS, and/or public review of the FEIS. Those consultation and coordination activities are addressed throughout this ROD and are summarized in the following sections.

5.5.1 U.S. Fish and Wildlife Service Consultation

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction to protect threatened and endangered species under the Endangered Species Act (ESA). Formal consultation with the USFWS under Section 7 of the ESA is required for any federal action that may adversely affect a federally-listed species. The desert tortoise (*Gopherus agassizii*), which occurs in the proposed project area, is a federally-listed threatened species, and therefore, formal consultation with the USFWS is required. This consultation was initiated through the preparation and submittal of a Biological Assessment (BA) which describes the proposed project to the USFWS. Following review of the BA, the USFWS

issued its Biological Opinion (BO), titled "Biological Opinion for the Eldorado-Ivanpah Power Transmission Project" File No. 84320-2010-F-0448 [CACA-49834], concluding that the action would not jeopardize the continued existence of the desert tortoise. The BO also includes terms and conditions that will be followed by the applicant to reduce any anticipated adverse impacts. The final BO is included in Appendix 2 of this ROD.

5.5.2 National Historic Preservation Act Consultation

A key part of a cultural resources analysis under NEPA and Section 106 of the National Historic Preservation Act of 1966 is to determine which of the cultural resources that a proposed or alternative action may affect are important or historically significant.

In accordance with 36 CFR Part 800.14(b), the BLM has prepared a Programmatic Agreement (PA) in consultation with the Advisory Council on Historic Preservation, the State Historic Preservation Officers in California and Nevada, and other interested parties. The PA addresses adverse effects and mitigation regarding the Management of Historic Electric Power Conveyance Systems in the States of California and Nevada. The executed PA is provided in Appendix 3, Programmatic Agreement. No other eligible properties will be adversely affected by the EITP. All other cultural resources have been avoided by the project.

5.5.3 Native American Tribal Consultation

The BLM initiated consultation with Native American tribes and groups that may have knowledge of the cultural resources of the proposed project area, in accordance with Section 106 of the National Historic Preservation Act. Twenty-three contacts from the following 11 Native American groups received letters and follow-up calls notifying them of the proposed project as the first step in the consultation process:

- Chemehuevi Indian Tribe;
- Colorado River Indian Tribes;
- Fort Mojave Tribal Council;
- Las Vegas Paiute Tribe;
- Moapa Band of Paiute Indians;
- Morongo Band of Mission Indians;
- Pahrump Paiute Tribe;
- San Manuel Band of Mission Indians;
- Serrano Nation of Indians;
- Timbisha Shoshone; and
- Twenty-Nine Palms Band of Mission Indians.

A search of the Native American Heritage Commission's Sacred Lands File (SLF) was conducted to determine any known Native American cultural resources in the proposed project area. The SLF search failed to indicate the presence of any Native American cultural resources in the proposed project area. As of the date of this document, tribal consultation did not result in the identification of cultural resources or historic properties to which the tribes attach religious or cultural significance within the proposed project area.

The 11 tribes were provided follow-up letters and copies of both the DEIR/EIS and the Final EIR/EIS. None of the tribes commented during the environmental review process and no tribes requested further information or provided comments related to cultural resources or historic properties within the project area.

5.5.4 State of California Coordination

5.5.4.1 California Public Utilities Commission

The DEIR/EIS and FEIR/EIS for this proposed project was developed as a joint environmental review document pursuant to a Memorandum of Understanding between the CPUC and the BLM dated August 25, 2008. The DEIR/EIS was circulated for agency and public review, and the comments received on the Draft and responses to those comments were provided in Appendix G of the FEIS. Subsequent to the publication of the joint FEIR/EIS, the BLM and the CPUC processes have been conducted separately. The CPUC continued its Commission Certification process through the release of a proposed decision and publication of their final certification in December 2010.

5.5.4.2 California Department of Fish and Game

The California Department of Fish and Game (CDFG) has the authority to regulate potential impacts to species that are protected under the California Endangered Species Act (CESA). The applicant must file an application for authorization for incidental take of the desert tortoise under Section 2081(b) of the CESA. The requirement to file with CDFG is included as a recommended Mitigation Measure.

5.5.4.3 Other

The U.S. Army Corps of Engineers (USACE) has jurisdiction to protect water quality and wetland resources under Section 404 of the Clean Water Act. Under that authority, USACE reviews proposed projects to determine whether they may impact such resources, and/or be subject to a Section 404 permit. The USACE has been consulted and the applicant has prepared a report delineating waters of the U.S. The USACE has not rendered a final opinion but has indicated the project will likely fall under Nationwide Permit 12, so each crossing of ephemeral drainages to Ivanpah Dry Lake will require its own Nationwide Permit. This process would not hold up the NEPA or CEQA environmental review process. The requirement to comply with requirements of the USACE is term and condition in this ROD.

The National Park Service manages the Mojave National Preserve (MNP), which is located near the proposed project area. Because of the proximity of the MNP, the National Park Service was invited to participate in scoping meetings and public workshops, and was provided the opportunity to review and provide comment on the EIR/EIS. Preliminary alternative routes identified by the applicant included alternatives that would have placed segments of the telecommunication line within the boundary of the MNP. None of the Alternatives that affected the MNP were carried forward for further consideration in the EIR/EIS due to permitting constraints.

BLM entered into a Cooperating Agency Memorandum of Understanding with Clark County for the EITP. The main concerns expressed by Clark County related to the proposed Southern Nevada Supplemental Airport and therefore key contacts were made with the Clark County Department of Aviation (CCDOA). The CCDOA provided comments on the Administrative DEIR/EIS, the DEIR/EIS and on the FEIR/ EIS. In addition, the Clark County Desert Conservation Program provided input on the project's effect on conservations easements in the Eldorado Valley. BLM continues to provide Clark County with project-related documentation for their review and evaluation.

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6. Final Agency Action

6.1 Right-of-Way Authorization

It is my decision to grant an electric transmission line right-of-way (ROW) grant CACA-49834 to Southern California Edison, subject to the terms, conditions, stipulations, Plan of Development, and environmental protection measures developed by the Department of the Interior. In addition, an amendment to existing ROW NVN-016656 will be granted by the Las Vegas Field Office Manager for the redundant telecommunications cable being installed on the Eldorado Lugo transmission line. In general, a decision of the BLM is not effective during the time in which an adversely affected person may file a notice of appeal (43 CFR 4.21[a][1]). However, according to regulation, Bureau of Land Management decisions issued under 43 CFR Part 2800 are and remain in effect pending appeal (43 CFR 2801.10[b]). Since this ROW decision was issued under 43 CFR Part 2800, it is and remains in effect as of the date of issuance.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4. If an appeal is taken, your notice of appeal must be filed with the Field Manager, Bureau of Land Management, Needles Field Office, 1303 Highway 95 South, Needles, California, 92363 or hand delivered to the above, within 30 days from the date of this decision. The appellant has the burden of showing that the decision appealed is in error.

If you wish to file a petition pursuant to regulations at 43 CFR 2801.10 or 43 CFR 2881.10 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed in this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

See Appendix 7 for filing information related to appeals and requesting a stay.

Approved by:

Raymond C. Lee
Needles Field Manager
Bureau of Land Management
U.S. Department of the Interior

19 May 11
Date

I concur:

Robert B. Ross Jr.
Las Vegas Field Manager
Bureau of Land Management
U.S. Department of the Interior

5/19/11
Date

Appendix 1
FEIS Comment Responses

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Appendix 1: Response to Comments

The following are responses to comment letters received after the publication of the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) published in November 2010. Although not required by the Federal Land Policy and Management Act (FLPMA), the National Environmental Policy Act (NEPA), or any applicable plan, policy or program, the Bureau of Land Management (BLM) voluntarily offered in the Dear Reader letter that accompanied the FEIR/EIS to accept public comment on the FEIR/EIS for 30 days after the Environmental Protection Agency published the Notice of Availability of the FEIR/EIS in the Federal Register, and to respond to all substantive comments in the Record of Decision. Comment letters are labeled 0028 through 0033 and are located at the end of this Appendix (comment letters received during scoping and letters received in response to the Draft EIR/EIS [DEIR/EIS], 0001 through 0027, are included in Appendix G of the FEIR/EIS).

List of Commenters

0028 – Center for Biological Diversity: Ileene Anderson

0030 – Western Watersheds Project: Michael J. Connor

0031 – Basin and Range Watch: Kevin Emmerich

0032 – Clark County Department of Aviation: Teresa R. Motley

0033 – Western Watersheds Project: Michael J. Connor

Comment Responses

0028 Comment Responses: Center for Biological Diversity

0028-1 Purpose and Need

A similar comment was addressed in Response to Comments 0023-2 in Appendix G of the FEIR/EIS. The following addresses the utility of the EITP: On a state level, the Eldorado Ivanpah Transmission Project (EITP) would be consistent with planning efforts to facilitate delivery of renewable energy, many of which include considerations of potential environmental effects in analyzing and ranking renewable energy potential. These analyses and reports are described in Section 1.2.2 of the EIR/EIS and consider a number of factors including generation potential, permitting feasibility (e.g., environmental concerns), interconnection points into the grid (e.g., existing transmission infrastructures), and the cost of generation and transmission. The EITP would be located in the Mountain Pass Competitive Renewable Energy Zone (CREZ) and would upgrade a portion of the Mountain Pass line segment group, which provides access to renewable energy in the Mountain Pass CREZ and may improve the power transfer capability between Arizona, Nevada, and California (RETI 2010). In addition, sufficient indicators exist—such as environmental reviews, recently approved projects (Ivanpah Solar Electric Generating System [ISEGS] and Silver State, among others), Large Generator Interconnection Agreements, Purchase Power Agreements, American Recovery and Reinvestment Act funding, and Department of Energy loan guarantees—to suggest that a number of projects are likely to be approved in the Ivanpah Valley in the near future. In order to be timely and meet demand/generation interconnection requirements and contractual agreements, transmission planning must occur in anticipation of needed development. Refer to Section 1.2.2 of the FEIR/EIS for additional information on renewable energy generation goals and planning.

0028-2 Biological Resources

Thank you for your comment.

0028-3 Biological Resources

Section 3.4.3.5 of the FEIR/EIS addresses desert tortoise impacts and describes the large home ranges that desert tortoise inhabit; therefore, it is not inconceivable that translocated tortoise from other solar projects would traverse the EITP project area. However, the details and locations associated with translocation activities for other future solar projects are not currently known (and thus cannot be analyzed) and would be coordinated with the appropriate Wildlife Agencies (U.S. Fish and Wildlife Service [USFWS], California Department of Fish and Game, Nevada Department of Wildlife). Similarly, MM BIO-12 of the FEIR/EIS states that this same consultation process with Wildlife Agencies must occur prior to construction activities for the EITP. During this process, Wildlife Agencies review and analyze the most current research data/recommendations (e.g., translocation issues) and issue stringent measures to be included as conditions of construction to protect the species.

0028-4 Biological Resources

Section 3.4.3.5 of the FEIR/EIS addresses desert tortoise impacts and includes potential impacts associated with relocation and handling of tortoise. MM BIO-12 of the FEIR/EIS provides measures to alleviate potential impacts from handling tortoise and associated relocation activities. It also requires consultation with Wildlife Agencies prior to construction activities for the EITP. During this process, Wildlife Agencies review and analyze the most current research data/recommendations (e.g., relocation issues) and issue stringent measures to be included as conditions of construction to protect the species and reduce significant mortality. Desert tortoise would be moved out of harm's way from construction equipment and monitored during construction activities.

0028-5 Cumulative Impacts

Section 5.2 of the FEIR/EIS describes the criteria for inclusion of a cumulative project in the cumulative scenario. The FEIR/EIS, which was published prior to December 2010, states the following:

> The projects that make up the cumulative scenario are located in close proximity to the EITP within the cumulative study area and are (1) completed, (2) approved and under construction, (3) approved but not yet under construction, or (4) proposed but not approved. A project is included in this cumulative analysis if information on the project was available in the BLM's database or identified during agency scoping or in another published cumulative analysis as of July 30, 2010. The Kern River Pipeline Company filed a ROW application with the BLM for an 8-inch diameter lateral pipeline on October 29, 2010, one week prior to the CPUC publication of their Notice of Availability of the FEIR/EIS. The FEIR/EIS was being printed before Kern River filed their application so it is easy to understand why this pipeline was not included in the cumulative analysis for EITP. A supplemental FEIS is not warranted as the impacts of the proposed pipeline are being analyzed in a separate NEPA analysis which can address the cumulative impacts.

0030 Comment Responses: Western Watersheds Project

0030-1 General

Thank you for your comment. Cumulative impacts, including impacts on desert tortoise within the Northern Mojave Desert Tortoise Recovery Unit, are addressed in Section 5.3.3 of the FEIR/EIS.

0030-2 Project Description

This comment is similar to Comment 0023-1 included in Appendix G of the FEIR/EIS. As described in Chapter 1, "Purpose and Need," in addition to the project as proposed by Southern California Edison (SCE), the EIR/EIS considers the environmental impacts of the ISEGS project as a Cumulative Action under NEPA and as part of the Whole of the Action under the California Environmental Quality Act (CEQA). The environmental impacts of other projects in the vicinity of the proposed project are assessed, in conjunction with the environmental impacts of the EITP, in Chapter 5, "Cumulative Scenario and Impacts." Refer to response to Comment 0023-1 for additional information on the rationale for including or not including specific projects as a Cumulative Action and as part of the Whole of the Action.

0030-3 Biological Resources

Section 3.4.3.8 of the FEIR/EIS discussed Transmission Alternative B, which does not pass through critical habitat for desert tortoise. This alternative, along with the proposed project and other alternatives, passes through suitable habitat that is likely occupied by desert tortoise. With the exception of the dry lake beds, high mountain passes, and developed areas around Primm, the majority of the Ivanpah Valley provides suitable habitat for desert tortoise, thus making is very difficult to find feasible alternatives that do not pass through potential desert tortoise habitat. The ISEGS solar plant will be located in suitable habitat for desert tortoise, making it impossible to formulate a transmission alternative that would not also impact suitable habitat.

0030-4 Alternatives

This comment is similar to comment 0023-3 in Appendix G of the FEIR/EIS and Comment 0031-19 on the FEIR/EIS. Two non-transmission system subalternatives are discussed in the Alternative Screening Report (ASR) (Appendix A-1 of the EIR/EIS) but not carried forward for analysis in the EIR/EIS. These subalternatives are discussed in Section 3.2.1 of the ASR and have been expanded in the FEIR/EIS to clarify the generation potential of non-transmission programs. The revised ASR in the FEIR/EIS includes an expanded discussion of 1) an In-Basin Generation Subalternative, which includes the development of in-basin generation, such as new solar, wind, and/or geothermal power plants, instead of developing new and upgraded transmission facilities to interconnect solar generation from the Ivanpah Dry Lake Area; and 2) a Demand-Side Subalternative, which includes demand-side programs such as ultraclean distributed generation and energy efficiency programs as outlined in the California Public Utilities Commission (CPUC) Code 1002.3. The In-Basin Generation Subalternative was eliminated because it could potentially result in transmission upgrades on the same scale as EITP; additionally, this subalternative would not meet the project objective to connect renewable resources in the Ivanpah Valley. Additionally, consideration of an in-basin generation alternative would require a programmatic-level environmental analysis that is outside the scope of the EITP EIR/EIS. The Demand-Side Subalternative was eliminated because it would not meet the project objectives of complying with California Senate Bill 1078 and California Senate Bill 107, which establish renewable portfolio standards for investor-owned utilities in California, including SCE. Additionally, this alternative is considered speculative and technically infeasible. For more information on non-transmission alternatives, refer to Appendix A-1 of the FEIR/EIS.

0030-5 Biological Resources

Impacts on special status nesting birds, bats, and reptiles from changes in air quality are generally discussed in the FEIR/EIS in Section 3.4.3.5. APM AES-7 would provide for reduction of potential impacts through measures to suppress fugitive dust. Specific to the desert tortoise, MM BIO-11 requires that dust suppression activities prevent random water pools from occurring, which can inadvertently attract desert tortoise. The connection between fugitive dust, vehicle emissions, and the desert tortoises' increased susceptibility to respiratory disease is not specifically

discussed. However, due to the temporary nature of linear work in any one area, the dust suppression activities described in APM AES-7, and the desert tortoise clearance and handling procedures that would be performed in advance of construction (MM BIO-12), there is a low probability of desert tortoise contracting respiratory illness during construction. Operation and maintenance procedures would be similar to current procedures; therefore, the probability of desert tortoise contracting respiratory illness during operation would also be low.

0030-6 Biological Resources

Potential impacts to special status species from implementation of the EITP are discussed in Section 3.4.3.5 of the FEIR/EIS. Required mitigation measures to be employed to avoid and/or minimize those potential impacts are provided in Section 3.4.4. Specific to desert tortoise, APM BIO-11 and MM BIO-12 require Wildlife Agency consultation and issuance of a Biological Opinion, which will clearly outline the compensation ratios that the Agencies require. Federal tortoise compensation requirements in California for BLM are determined by the Northern and Eastern Mojave Desert Management (NEMO) Plan amendment to the California Desert Conservation Area Plan. The NEMO plan specifies a 1:1 compensation ratio for non-critical desert tortoise habitat and a 5:1 compensation ratio in critical habitat. The EITP will result in approximately 51 acres of disturbance to habitat in California: 2 acres of critical habitat and 49.7 acres of non-critical habitat. Compensation in Nevada for the BLM is established at a rate of $774/acre with a multiplier factor for habitat quality (Hastey et al. 1991). Total payments to the BLM will be approximately $489,744 and estimated payments to the Clark County Desert Conservation Program will be $6,811. Total acreage requiring compensation in Nevada is 220 acres of non-critical habitat and 93.6 acres of critical habitat. Acquisition requirements for rare plants are provided for in MM BIO-3.

0030-7 Biological Resources

Section 3.4.3.5 of the FEIR/EIS discusses impacts associated with potential invasion of noxious weeds due to project ground disturbance. The existing right-of-way (ROW) where most of the work will take place has been surveyed for the presence of invasive plants and the results of this survey submitted to the BLM. MM BIO-1 requires a further pre-construction noxious weed inventory, and APM BIO-10 and MM BIO-4 require the production and implementation of an Invasive Plant Management Plan to prevent the potential establishment of a 'weed corridor' due to project construction. As described in Section 5.3.3.2, invasive and noxious weed species have been identified throughout the cumulative impact area due to past physical disturbances on the landscape and the use of existing ROWs. It would be difficult to accurately quantify the potential loss of habitat from invasive plants due to the existing disturbed state of the landscape.

0030-8 Cultural Resources

As described in Section 3.05 of the FEIR/EIS, a cultural resources survey was conducted for all areas that would be disturbed by project construction and operation. Cultural Resources 36-10315 (CA-SBR-10315H) would be permanently disturbed by construction of the EITP; however, MM CR-2 would mitigate this impact by documenting the resource according to Historic American Engineering Record level 2 standards. MM CR-1, which requires a cultural monitor during construction, would ensure that no impacts would occur due to the unanticipated discovery of subsurface cultural resources that were not recorded as part of the survey. Cumulative impacts on cultural resources are discussed in Section 5.3.4 of the FEIR/EIS.

0030-9 Hazards and Safety

The preferred alternative for EITP is not located in the vicinity of these spills, so there is no potential for release of contamination from construction of EITP.

0030-10 Cumulative Impacts

Cumulative effects are assessed in Chapter 5 of the FEIR/EIS. Tables 5-1 and 5-2 comprise the complete list of projects considered in the cumulative analysis; these projects are shown on Figure 5-1.

The portion of the EITP that would be located within the Ivanpah Desert Wildlife Management Area (DWMA) includes a segment of the telecommunications line, where it would be installed underground adjacent to Nipton Road and the microwave tower. In the FEIR/EIS, the cumulative analysis of impacts to biological resources was completed holistically without breaking out impacts for specific locations or project components. The telecommunications line would be installed within a roadway maintained by the San Bernardino County Road Department and Nevada Department of Transportation along the edge of the critical habitat. The total disturbance for the EITP within the DWMA is approximately 2 acres. The projects considered in the cumulative analysis that are located within the Ivanpah DWMA include the Molycorp wastewater pipeline, the Molycorp evaporation pond, and the Ivanpah Dry Lake Recreation Area. The recreation area is a land use designation, and both the Molycorp wastewater pipeline and the Molycorp evaporation pond pre-date the NEMO.

0031 Comment Responses: Basin and Range Watch

0031-1 Alternatives

Thank you for your comment. The EITP would be located within designated utility corridors, as shown in Chapter 1 and 3 of the FEIR/EIS (Figure 1-2 and Figure 3.9-1).

0031-2 Air Quality

Thank you for your comment. The detailed calculations of greenhouse gas (GHG) emissions for both construction and operation of the project are included in Appendix D of the FEIR/EIS. Appendix D also includes a list of assumptions used in determining the GHG emissions associated with the EITP, including one percent annual sulfur hexafluoride (SF_6) leakage.

Calculation of loss of desert carbon sequestration would be speculative and beyond the scope of the EIR/EIS. The capability of a desert ecosystem to store carbon has not been firmly established. Further, there are no data to suggest that the project would interfere with the current mechanisms of carbon flux in the desert ecosystem.

0031-4 Biological Resources

Thank you for the information provided.

0031-5 Biological Resources

Thank you for the information provided.

0031-6 Biological Resources

In Section 3.4.3.5 of the FEIR/EIS, the importance of avoiding soil disturbance in stabilizing native vegetation communities and preventing invasive weed encroachment is discussed. MM BIO-2 requires the production and implementation of a Reclamation Plan that includes criteria for treatment of topsoil.

0031-7 Biological Resources

Section 3.4.1.1 of the FEIR/EIS discusses the noxious and invasive weeds found on the project site through inventory surveys. Some of the invasive plant species indicated in Comment 0031-7 were found onsite (see Table 3.4-3). Invasive plant control is required as outlined in MM BIO-1 and MM BIO-4.

0031-8 Biological Resources

Concerning invasive plants, please see the answer to Comments 31-6 and 31-7. Regarding avian impacts, these impacts are discussed under Birds in Section 3.4.3.5 of the FEIR/EIS. The discussion includes increased risk of death of adult raptors and larger non-raptor species by collision with new transmission line towers. APM BIO-8 would be implemented by the EITP to reduce potential avian collisions with transmission structures.

0031-9 Biological Resources

Section 3.4.1.1, under Birds, discusses the potential nesting habitat present for special status birds in the Clark Mountains. Additionally, APM BIO-7 and MM BIO-15 would be implemented to avoid and minimize impacts to nesting birds on the project site, including the Clark Mountains.

0031-10 Biological Resources

Cumulative impacts due to the introduction of new sources of light and glare are discussed in Section 5.3.1.4 of the FEIR/EIS. The proposed Ivanpah Substation would have a negligible contribution to cumulative impacts under this criterion because the lighting would be infrequent, shielded to prevent light spillage, and directed downward. Currently, no other components of the EITP would require permanent lighting.

0031-11 Biological Resources

Please see response to Comment 0031-10.

0031-12 Biological Resources

Potential impacts on Bald and Golden Eagles are discussed in Section 3.4.3.5. In addition to Applicant Proposed Measures (APMs) and Mitigation Measures (MMs) designed to reduce impacts on biological resources and avian species, MM BIO-19 is required. MM BIO-19 requires development and implementation of an Avian Protection Plan according to recent USFWS guidance (USFWS 2010). The Plan must be submitted and approved by the BLM and USFWS prior to construction activities. This Plan will outline steps and conservation measures to prevent and reduce impacts on Golden Eagles and other large raptors. Implementation of this measure would provide compliance with the 'no net loss' standard for Golden Eagles identified in the Eagle Act Rule.

0031-13 Biological Resources

Analysis of the potential impacts to bighorn sheep and their movement corridors is discussed in Section 3.4.3.5 of the FEIR/EIS under NEPA and CEQA determinations. MM BIO-13 was developed in direct consultation with the Wildlife Agencies and institutes avoidance and minimization measures to protect the sheep. MM BIO-13 requires that pre-construction surveys be performed for bighorn sheep in the project area prior to construction and a biological monitor be present during the duration of the construction to monitor bighorn sheep in all suitable habitat. Sensitive bighorn sheep habitat in the mountain ranges would also be avoided during critical life cycles of the sheep. Additionally, the majority of the project would be located in an existing ROW that already bisects bighorn ranges.

0031-14 Biological Resources

Cumulative impacts on desert tortoise are discussed in Section 5.3.3.4, and Figure 5-5 shows both suitable and critical desert tortoise habitat in relation to projects considered in the cumulative scenario. As shown in Table 5-7, the EITP's contribution to cumulative impacts on desert tortoise habitat would be approximately 0.06 percent on suitable habitat and 0.055 percent on critical habitat. To mitigate these effects, MM BIO-12 would require the applicant to coordinate with the Wildlife Agencies, provide rigorous clearance surveys and construction monitoring for desert tortoise, and limit human/equipment interactions with individual tortoises. With the implementation of these measures and because the EITP's contribution to effects on suitable and critical habitat would be minimal, EITP's contribution to cumulative impacts would be reduced to less than significant or minor levels. Comments that relate to direct and indirect impacts to desert tortoise that were made for the ISEGS and Silver State projects, recommended changes in BLM land use designations, solar project translocation plans, and California Energy Commission hearings and testimony are outside the scope of the EITP cumulative impact analysis.

0031-15 Biological Resources

Please see response to Comment 0031-14 for the EITP's contribution to cumulative impacts on desert tortoise.

0031-16 Biological Resources

Please see response to Comment 0031-14 for the EITP's contribution to cumulative impacts on desert tortoise.

0031-17 Biological Resources

Please see response to Comment 0031-14 for the EITP's contribution to cumulative impacts on desert tortoise.

0031-18 Biological Resources

Thank you for your comment. The USFWS issued a Biological Opinion for the EITP in compliance with Section 7(a)(2) of the Endangered Species Act.

0031-19 Biological Resources

Please see response to Comment 0031-14 for the EITP's contribution to cumulative impacts on desert tortoise.

0031-20 Alternatives

This comment is similar to Comment 0023-3 in Appendix G of the FEIR/EIS and Comment 0030-4 of the FEIR/EIS. Please see response to Comment 0030-4 above.

0032 Comment Responses: Clark County Department of Aviation

0032-1 Aesthetics

The power towers that would need to be lighted to comply with Federal Aviation Administration regulations are part of the ISEGS project. Section 3.2.6 of the FEIR/EIS includes a discussion of the combined effects of the ISEGS project and the EITP.

Although a land transfer for the Southern Nevada Supplemental Airport (SNSA) has been completed, the environmental review for the SNSA has not been completed. Therefore, lighting requirements for EITP transmission towers due to proximity to the SNSA are discussed in Section 5.1.3 of the Cumulative Scenario and Impacts chapter.

0032-2 Land Use

Thank you for your comment. This document considers all projects that have not completed an environmental review as "proposed projects."

0032-3 Land Use

Thank you for your comment. This document does not differentiate between "currently on hold," "on hold indefinitely," and "temporarily suspended." The Clark County Department of Aviation has not provided any information to indicate when the SNSA environmental review process will begin again.

0032-4 Cumulative Impacts

Table 5-2, of Chapter 5 of the FEIR/EIS, states that the additional land for the Ivanpah Airport Environs Overlay is conditional upon project approval. Due to differences in status between the SNSA and the Ivanpah Airport Environs Overlay, they are treated as separate projects in the cumulative analysis.

0033 Comment Responses: Western Watersheds Project

0033-0 Cumulative Impacts

Section 5.2 of the FEIR/EIS describes the criteria for inclusion of a cumulative project in the cumulative scenario. The FEIR/EIS, which was published prior to December 2010, states the following:

> The projects that make up the cumulative scenario are located in close proximity to the EITP within the cumulative study area and are (1) completed, (2) approved and under construction, (3) approved but not yet under construction, or (4) proposed but not approved. A project is included in this cumulative analysis if information on the project was available in the BLM's database or identified during agency scoping or in another published cumulative analysis as of July 30, 2010. The Kern River Pipeline Company filed a ROW application with the BLM for an 8-inch diameter lateral pipeline on October 29, 2010, one week prior to the CPUC publication of their Notice of Availability of the Final EIR/EIS. The Final EIR/EIS was being printed before Kern River filed their application so it is easy to understand why this pipeline was not included in the cumulative analysis for EITP. A supplemental Final EIS is not warranted as the impacts of the proposed pipeline are being analyzed in a separate NEPA analysis that can address the cumulative impacts.

0033-1 Cumulative Impacts

Cumulative effects are assessed in Chapter 5 of the FEIR/EIS. Tables 5-1 and 5-2 comprise the complete list of projects considered in the cumulative analysis; these projects are shown on Figure 5-1.

The portion of the EITP that would be located within the Ivanpah DWMA includes a segment of the telecommunications line, where it would be installed underground adjacent to Nipton Road and the microwave tower. In the FEIR/EIS, the cumulative analysis of impacts to biological resources was completed holistically without breaking out impacts for specific locations or project components. The telecommunications line would be installed within a roadway maintained by the San Bernardino County Road Department and Nevada Department of Transportation along the edge of the critical habitat. The total disturbance for the EITP within the DWMA is approximately 2 acres. The projects considered in the cumulative analysis that are located within the Ivanpah DWMA include the Molycorp wastewater pipeline, the Molycorp evaporation pond, and the Ivanpah Dry Lake Recreation

Area. The recreation area is a land use designation, and both the Molycorp wastewater pipeline and the Molycorp evaporation pond pre-date the NEMO.

References

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Appendix 2
Biological Opinion

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
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Las Vegas, Nevada 89130
Ph: (702) 515-5230 ~ Fax: (702) 515-5231

April 29, 2011
File No. 84320-2010-F-0448

Memorandum

To: Assistant Field Manager, Needles Field Office, Bureau of Land Management, Needles, Nevada

Assistant Field Manager, Las Vegas Field Office, Bureau of Land Management, Las Vegas, Nevada

From: Acting State Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Formal Consultation for the Eldorado-Ivanpah Power Transmission Project, Clark County, Nevada and San Bernardino County, California

This transmits the Fish and Wildlife Service's (Service) biological opinion in response to your memorandum received August 17, 2010, requesting initiation of formal consultation for the Eldorado-Ivanpah Power Transmission Project. The Bureau of Land Management (BLM) determined that the proposed issuance of a right-of-way for the subject project may adversely affect the desert tortoise (*Gopherus agassizii*) (Mojave population), a species listed as threatened under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) and its critical habitat. The Nevada Fish and Wildlife Office is the lead Service office for this consultation in coordination with the Ventura Fish and Wildlife Office. BLM's Las Vegas Filed Office is the lead Federal agency for the consultation.

The attached biological opinion is based on information provided in your memorandum dated August 16, 2010; the August 7, 2010, biological assessment for the project; discussions between the Service and BLM; and our files. A complete project file of this consultation is available in the Service's Nevada Fish and Wildlife Office in Las Vegas.

If you require additional assistance, please contact Michael Burroughs in the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230. Please reference File No. 84320-2010-F-0448 in future correspondence concerning this consultation.

Jenny A. Ericson

TAKE PRIDE IN AMERICA

Attachment

cc:
Adaptive Management Coordinator, Desert Conservation Program, Las Vegas, Nevada
Supervisory Biologist – Habitat, Nevada Department of Wildlife, Las Vegas, Nevada
Wildlife Biologist, California Department of Fish and Game, Palmdale, California
District Manager, California Desert District, Bureau of Land Management, Moreno Valley, California
Field Supervisor, Ventura Field Office, Fish and Wildlife Service, Ventura, California

ATTACHMENT

BIOLOGICAL OPINION
File No. 84320-2010-F-0448

A. CONSULTATION HISTORY

On August 17, 2010, the Service received a memorandum from the Bureau of Land Management (BLM), dated August 16, 2010, requesting initiation of formal consultation and determined that the information provided in the biological assessment (BA) was sufficient to initiate formal consultation on that date.

On August 23, 2010, BLM submitted the first draft raven management plan to the Service for review. Several draft raven management plans followed with numerous conference calls and meetings involving consultants for the project proponent, BLM, Nevada Department of Wildlife, and the Service. The Service received the final plan (Appendix A) from BLM on February 8, 2011.

On December 8, 2010, the Service extended the consultation period for the consultation to include an additional 30 days to allow for review of drafts and respond to comments.

On December 14, 2010, Clark County provided fee payment instructions to the Service and BLM for inclusion in the proposed action to apply towards habitat disturbance within the Boulder City Conservation Easement (BCCE). BLM accepted the language on December 28, 2010.

On December 20, 2010, Clark County submitted a recommended measure to include in the proposed action addressing fees for disturbance of 8.8 acres of non-critical desert tortoise habitat outside the BLM utility corridor but within the BCCE.

On January 18, 2011, the Service provided a draft biological opinion to BLM for review and comments. On January 27, 2011, BLM submitted comments on the draft to the Service.

On February 8, 2011, the Service provided a second draft biological opinion to BLM and the project proponent, Southern California Edison (SCE). Comments on the draft were provided to the Service on March 21, 2011. BLM requested that SCE consider burying the 33-kilovolt (kV) line to power a microwave station in Nipton, California instead of constructing overhead transmission lines and associated towers.

On March 22, 2011, BLM provided the Service an analysis of the effects to desert tortoise habitat for burying the 33-kV line. BLM continued to work with SCE to minimize raven effects including a modified power pole design.

On April 11, 2011, the Service received a modified power pole design from SCE and BLM for the 33-kV overhead power distribution to Nipton, California. As requested by BLM, the Service included the modified pole structure into the proposed action for the overhead 33-kV line to Nipton (SCE 2011).

B. DESCRIPTION OF THE PROPOSED ACTION

1. Summary

BLM proposes to a right-of-way (ROW) grant for the Eldorado-Ivanpah Transmission Project (EITP) to SCE to construct and maintain the project. The EITP would be located in the Eldorado and Ivanpah valleys and require ROWs from both the Las Vegas and California Desert offices of the BLM. The EITP would provide the electrical facilities necessary to transmit up to 1,400 megawatts (MW) of new solar generation in the Ivanpah Dry Lake Area. The EITP consists of the construction of a new approximately 35-mile double-circuit 220-kV transmission line between the Ivanpah Dry Lake Area and the existing Eldorado Substation, a subtransmission line to connect the proposed Ivanpah Substation to the existing 115-kV subtransmission system, and a telecommunication system including a microwave site (Figure 1). Approximately 2.5 miles of the telecommunications line would occur within the Ivanpah Critical Habitat Unit (CHU), and 11.3 miles of the transmission line and 14.1 miles of the telecommunications line would occur in the Piute-Eldorado CHU. Approximately 7.1 miles of the proposed transmission line and 5.6 miles of the telecommunication route are located within the boundary of the BCCE.

The Service determined that the action area consists of the ROW for the transmission and distribution lines, the Eldorado-Lugo 500-kV transmission line upon which an optical ground wire (OPGW) will be installed and towers to be reinforced, a 600-800-foot subtransmission line, and microwave tower, and communication site. Also included in the action area are construction yards and helicopter staging areas, access roads, the Ivanpah Substation, and the Ivanpah Solar Electric Generating System (ISEGS) Project in Ivanpah Valley, California which will be connected to the project transmission infrastructure. The effects to desert tortoise as a result of the ISEGS and the Ivanpah Substation are being evaluated by the Service's Ventura Fish and Wildlife Office; the EITP will be part of the environmental baseline for that consultation.

A detailed description of the proposed project is available in the BA (BLM 2010) and is hereby incorporated by reference.

2. Facilities and Construction

The EITP consists of three main components: (1) remove and replace the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line with the new Eldorado-Ivanpah 220-kV double-circuit transmission line; (2) installation of a fiber-optic telecommunication route and microwave transmitters; and (3) a subtransmission line to connect the proposed Ivanpah Substation to the existing 115-kV subtransmission system. The EITP also includes construction of the new Ivanpah Substation; however, effects to the desert tortoise

associated with this component of the EITP are being evaluated during reinitiation of consultation for the ISEGS Project by the Service's Ventura Fish and Wildlife Office.

Site preparation and construction would be accomplished using many different types of equipment and vehicles to facilitate multiple project efforts such as road clearing and grading, dismantling and removal of existing facilities, moving equipment and material, and installing project components. Equipment to be used would include small vehicles, such as pick-up trucks, up to large semi-trucks for hauling equipment, material, and personnel, specialized trucks for specific work elements such as drill rigs, concrete mixers, pumping trucks, bucket trucks, as well a boom crane, rough terrain crane, truck cranes and other support trucks for moving and erecting the towers and substation equipment. Helicopters will potentially be used in areas where access is limited or impractical for particular activities and for transmission line stringing operations. Tensioning, pulling, and splicing equipment will be used for wire stringing operations. The transmission line, telecommunication, and subtransmission line components and anticipated disturbance are summarized below and in Table 1-3 of the BA.

3. Transmission Line

The transmission line rebuild involves the removal of approximately 35 miles of the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115-kV transmission line and installation of a new double-circuit 220-kV transmission line between the proposed Ivanpah Substation in California and the existing Eldorado Substation in Nevada (Figure 1).

The proposed Eldorado-Ivanpah 220-kV transmission line begins at the existing Eldorado Substation located in the Eldorado Valley, Nevada. The line exits the substation to the north using the existing 115-kV transmission line ROW. The EITP will be constructed within an existing SCE transmission line ROW which contains areas of pre-existing ground disturbance. However, the existing SCE 70- to 100-foot-wide ROW will need to be widened to a minimum 100-foot to 130-foot-wide ROW to accommodate the 220-kV transmission line. At major utility transmission line crossings, a 250-foot ROW would be required for side-by-side single-circuit 220-kV steel H-frame structures. New spur roads will be required for the new towers since the existing towers have no spur roads (they were built in 1930 - 1931). There is a possibility that existing transmission lines of other utilities may have to be modified in order to facilitate the crossing of the proposed 220-kV transmission line.

Pre-construction Technical Surveys

Technical pre-construction surveys would be required to complete the detailed engineering designs, to evaluate necessary erosion and other environmental controls, and to determine final locations of the proposed transmission structures. During this phase, the project design would be modified to avoid environmentally sensitive areas, including desert tortoise habitat, or to ensure structural integrity and sustainability. During the surveys, crews would locate spur road centerlines, grades, and soil boring locations. Using results from the pre-construction surveys, SCE would make final determinations of road location curvature, cuts and fills, grades and

drainage, and necessary erosion controls in accordance with design standards and practices and/or landowner requirements.

Construction Yards and Helicopter Staging Locations

Project construction would begin with establishment of up to seven temporary construction yards and two helicopter landing sites located at strategic points along the route. Providing yard space for equipment and materials storage and staging will involve clearing and possibly grading (Table 1 of BA). However, construction yard sites were selected and may be further configured with consideration of avoiding habitat impacts when practical and the majority of the proposed sites are located in previously-disturbed or developed areas. Two construction yards are proposed to be located in California, including one in Nipton for construction of telecommunication features, and the other five construction yards would be in Nevada. The identified locations of each of the construction yards and helicopter landing zones are illustrated in Appendix C of the BA. During the peak construction period, approximately 80 private commuting vehicles and the construction vehicles/equipment would also be parked at the construction yards. Crews would load materials onto work trucks and drive to the current construction location. At the end of each day, crews would return to the yard in their work vehicles and depart in their private vehicles.

Helicopters would be mainly used during the transmission line stringing activities and in areas with limited access. Two helicopter landing zones have been identified east and west of the McCullough Range. These sites may be refined or relocated as required with consideration of minimizing habitat impacts when practical.

Access and Spur Roads

Transmission line roads consist of access roads and spur roads. Access roads occur between tower sites and serve as a main transportation route along the transmission line ROW. Spur roads usually lead from the access roads and terminate at one or more structure sites. Approximately 35 miles of existing main roads would be utilized to support the proposed 220-kV line construction and operations. In addition, more access roads would be required for construction and maintenance of the telecommunications facilities, as well as additional access roads for connecting the project facilities to support and logistics areas, such as the road coming from Jean to the project ROW.

Additionally, 1.2 miles of new access roads and 1.7 miles of new spur roads would be constructed to allow passage of construction vehicles to the construction sites (Appendix C of BA). Upgrades and new construction may require vegetation clearing and grading based on site conditions. The new spur roads would be a minimum of 14 feet wide. Most spur roads would be left in place to access the facilities for operations and maintenance.

The existing access and spur roads in the project area are generally in good condition due to regular maintenance; however, some roads might require reconstruction and maintenance prior to construction activities. Reconstruction work would include clearing, grading, and compacting the existing roads to remove potholes, ruts, and other surface irregularities to provide a smooth

and dense surface capable of supporting heavy equipment. Specific locations for reconstruction work would depend on impacts of weather conditions over the existing roads and final project engineering design.

Steps Required for Dismantling and Removal of Existing 115-kV Transmission Facilities

- Rehabilitation and grading of existing roads.
- Wire-pulling sites would be located every 15,000 feet along the existing utility corridor, and would include locations at dead-end structures and turning points.
- Cable removal – A 3/8-inch pulling cable would be used to remove the old conductor.
- Structure Removal – A crane truck or rough-terrain crane would be used to support the structure during removal; a crane pad of approximately 50 by 50 feet may be required to allow a removal crane to be set up adjacent to the structure.
- Footing Removal – The existing lattice steel tower (LST) and H-frame footings would be removed to a depth of approximately 1 to 2 feet. Holes would be filled with removed soil and compacted, and then the area would be smoothed to match the surrounding grade.

Site Preparation

Installation of the 220-kV transmission line would require construction of approximately 216 new LSTs and approximately 21 steel H-frame structures. SCE would grade and/or clear the pad to create a vegetation-free surface for footing construction. Grading would be conducted so that water would run in the direction of the natural drainage avoiding ponding and/or erosion. Soils in the graded area would be compacted to support heavy vehicular traffic.

Where feasible, SCE would apply alternative methods such as drive and crush, mowing, and trimming of the laydown areas instead of clearing vegetation. The structure locations and the 25-foot clearance area around the structures would require clearing. The LSTs and steel H-frame structures would be assembled in an approximately 200-by-200-foot laydown area. To erect either the LSTs or the steel H-frame structures, a crane pad (a flat, vegetation-free area) may need to be established within the laydown area.

Each of the new LSTs and H-frame structures for the project would require multiple drilled, poured-in-place concrete footings to form the structure foundation. The size of the foundation would depend on the type of structure, soils conditions, and topography. LST foundations would consist of four concrete footings, while H-frames would have two concrete footings. On average, each footing for an LST and steel H-frame structure would project approximately 1 to 4 feet above ground level. The actual depth of footings would depend on specific site soil conditions and topography and would be determined during final engineering; however, the maximum anticipated depth below ground surface is 45 feet. Where excavation holes need to be drilled in soft or loose soil or if they extend into groundwater, they would be stabilized with casings or drilling mud slurry. The drilling/slurry mud would be disposed at an approved facility, in accordance with SCE's waste management practices.

In areas not accessible by road, equipment and material could be deposited at structure sites using helicopters or by workers on foot, and crews could prepare the footings using hand labor

assisted by hydraulic or pneumatic equipment or other methods; approximately 15 towers in the McCullough Range may be difficult to access by road. Following excavation of the foundation footings, steel reinforced cages and stub angles would be set, survey positioning would be verified, and concrete would then be placed. Steel reinforced cages and stub angles would be assembled at laydown yards and delivered to each structure location by flatbed truck. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers.

Structure Assembly and Erection

Structural components of the LSTs and H-frames would be trucked to the individual sites. LSTs and H-frames would be assembled at laydown areas at each site, and then erected and bolted to the foundations. Ground disturbance would generally be limited to the laydown areas, which would typically occupy an area of 200-by-200 feet. As necessary, vegetation would be removed and the areas would be graded.

For steel H-frame structures, steel work would consist of hauling the poles in sections to their designated sites using semi-trucks with 40-foot trailers and rough-terrain cranes. At the site, the poles would be set on the foundations once the concrete foundation had been cured. The poles could either be assembled into a complete structure or set one piece at a time by stacking and jacking them together, depending on the terrain and available equipment. Laydown areas would be established for the assembly process at each H-frame structure location. Where road access is available, assembled sections would be lifted into place by a crane. The crane pad would be located transversely to the structure and set up approximately 60 feet from its centerline. The crane would move along the ROW to erect subsequent structures. For structures that would be located in terrain inaccessible to a crane, helicopters may be used for structure erection.

Helicopter use is expected only in the McCullough Pass area and for line stringing. The area of operations for helicopters would be limited to helicopter staging areas near construction locations that are considered safe locations for landing. Final siting of staging areas would be conducted with the input of the helicopter contractor and affected private landowners and land management agencies.

Conductor Installation

Stringing includes all activities associated with installation of the transmission line conductors and OPGW onto the LSTs and/or the steel H-frames. The dimensions of the area needed for the stringing setups associated with conductor installation depend on terrain.

An overhead OPGW would be installed on the transmission line for shielding and communication. On the EITP 220-kV transmission line, the pulling and tensioning sites would be used for both wire and OPGW installations, while the proposed stringing activities on the Eldorado–Lugo 500-kV line would be for the OPGW installation only.

The puller, tensioner, and splicing set-up locations would be temporary and the land would be restored to its previous condition following completion of pulling and splicing activities. When possible, existing level areas and existing roads would be used, to minimize the need for grading and cleanup.

The typical areas needed for pulling, tensioning, and splicing equipment setup sites would be:

- 150 by 500 feet for tensioning equipment,
- 150 by 200 feet for pulling equipment, and
- 150 by 100 feet for splicing equipment.

Guard structures are temporary facilities that protect underlying areas during wire stringing operations. They are designed to stop the movement of a conductor if it falls during installation. Typical guard structures are 60- to 80-foot wooden poles. Temporary nets also could be installed to protect some structures located under the transmission lines. Guard structures are usually removed once a conductor is installed. SCE has estimates that approximately 16 guard structures would be necessary.

4. Telecommunication Line

Telecommunications facilities associated with the Ivanpah Substation and the new 220-kV transmission line will be constructed using two diverse telecommunication paths. The first telecom line will use OPGW on the new 220-kV transmission line. The second telecom line would consist of OPGW on the existing Eldorado-Lugo 500-kV transmission line from Eldorado Substation to Nipton Road (Highway 164), where it will then be installed underground in the road shoulder on the north side of Nipton Road to the town of Nipton. Installing the OPGW on the 500-kV transmission line will require approximately 45 transmission towers to be reinforced to support the additional wind loading of the OPGW. All towers on the 500-kV line have existing access and spur roads. At Nipton, the telecom line extends underground to the north approximately 0.6 mile to a new microwave tower and then by microwave to the Ivanpah Substation. The microwave site at Nipton will also require installing a wood pole distribution line for power. A construction yard will be located at Nipton.

Permanent impacts include: underground vault locations for the underground fiber-optic cable; wood distribution pole locations; and the microwave site. Temporary impacts include: OPGW pulling, splicing, and tensioning locations and work areas around towers requiring retrofitting; underground fiber-optic cable installation, pulling and splicing areas; installation of wood poles and conductors for the distribution line; and the construction yard.

Contractors would construct the telecommunication system and SCE would be responsible for administration and inspection. During some stages of the proposed project, multiple locations would be under construction simultaneously. Modifications of the existing Eldorado–Lugo

500-kV towers might include reinforcing or extending the structure body, installing horizontal diaphragms, and reinforcing structure legs. SCE would develop detailed engineering drawings and procedures for fabrication and installation for each of the structure modifications.

Optical Ground Wire Installation

For proposed project communications, OPGW segments would be installed on both the EITP 220-kV transmission line structures and along a redundant path that extends 25 miles to the south on the Eldorado–Lugo 500-kV transmission line. OPGW installation would be performed in the same manner as the conductor installation, as described above for the transmission line.

OPGW is typically installed in continuous segments, each up to 19,000 feet long, depending on various factors including line direction, inclination, and accessibility. Pulling and tensioning sites for the telecommunications line would be the same as those proposed for the 220-kV conductor installation. The eastern ground wire would be replaced with OPGW on the existing Eldorado–Lugo 500-kV line from Nipton Road to Eldorado Substation.

Distribution line poles would be replaced if a pole did not meet wind load requirements with addition of fiber cable. Replacing a distribution line pole requires a five-person crew, one pole trailer truck, one pole digger truck, and one crew truck. An approximately 30-by-40-foot work area is required for the work. A hole about 8 feet deep would be drilled next to the existing pole, and a new pole would be erected. A conductor would be transferred from the existing pole to the new pole and the old pole would be cut or removed.

Underground Installation

Following installation of the OPGW, on the last tower at each end of the transmission line, the overhead fiber-optic would be spliced to another section of fiber cable that would run in underground conduit from the splice box into the communication room inside the adjacent substation. A 40-by-60 foot work area, two splice trucks with pulling equipment, and a four-person crew would be required for the underground cable installation. In addition, a three-person crew would be required to complete the fiber-optic splicing.

Fiber-Optic Cable Installation

The overhead fiber-optic cable would be installed by attaching cable to structures in a manner similar to that described above for the transmission line stringing. Installation would involve attaching the cable to cross arms on distribution poles. This would require the use of a bucket line truck. The dimensions of the area needed for stringing setups vary depending on the terrain; however, a typical stringing setup is 40 by 60 feet. Where necessary due to space limitations, crews can work from within a smaller area.

Installation of Microwave Tower and Communication Site

An approximately 100-by-100-foot area would be required for constructing each new communication site. Chain link fencing would be installed around the communication site perimeter. A typical communication site consists of a communication building, microwave tower, and generator/fuel tank. A typical communication building is either a block wall-type

building to be constructed on site or a prefabricated building delivered to the site. Prefabricated buildings are set on a concrete foundation using a crane. The typical building size is 36 by 12 feet; the building consists of a generator room and an equipment room. Dimensions of the communication building would be determined during final engineering design. A separate concrete pad with a 10-foot separation from the communication building would be constructed for fuel tank installation.

The required area for a typical free-standing, four-legged lattice steel communication tower is 25 by 25 feet. For the proposed project, the tower would be built outside the communication room or next to the mechanical and electrical equipment room (MEER) within the substation. Concrete footings would be installed to support the tower. Heavy equipment needed for construction would include ready-mixed concrete trucks for the footings and a crane for tower erection and antenna installation.

Subtransmission Line

A new 600- to 800-foot section of 115-kV line would be strung from a connection point at milepost 34 on the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV line to a new rack position at the proposed Ivanpah Substation, to create the Cool Water–Baker–Dunn Siding–Mountain Pass–Ivanpah 115-kV subtransmission line. At the transition point of the proposed project transmission line route going north into the Ivanpah Substation, seven existing LST H-frame structures would be removed and replaced with one single-circuit engineered tubular steel pole (TSP) and six lightweight steel (LWS) H-frames within the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line ROW. In addition, six LWS H-frames would be installed at replaced structures to meet current requirements. Approximately three single-circuit engineered TSPs would be installed and looped in to the proposed Ivanpah 115-kV rack position. These TSPs would require concrete footings. The LWS H-frames would be buried and backfilled with native soils. Construction of these structures would follow the general steps described for the transmission line above for site preparation, foundation installation, structure assembly, and conductor installation.

5. Distribution Lines

A 33-kV distribution line would be installed to provide reliable lighting and power service to the new Ivanpah Substation. This component would consist of approximately 4,800 feet of new underground and approximately 1,600 feet of new overhead 33-kV circuitry, and two new remote control switches that would be installed adjacent to Densmore Drive at the California State line, near Primm, Nevada. One of the switches would be located south of the Ivanpah Substation and the second would be located next to the Primm Valley Golf Club's Desert Course.

In addition, approximately 4,300 feet of a new 33-kV overhead line would be installed between the town of Nipton and the new microwave site proposed to be located northeast of Nipton. A transformer would be installed on an overhead pole connecting to the microwave site using an underground duct. The overhead line would be installed along the side of an existing unnamed

dirt road. SCE will use design features for this portion of the overhead distribution line that would minimize perching opportunities by utilizing a vertical configuration of the insulators to eliminate the perching opportunities associated with cross members (Figure 2).

Ivanpah Substation Construction

BrightSource, the ISEGS proponent, will prepare the site for the proposed Ivanpah Substation for construction by SCE. Site preparation by BrightSource will include conducting desert tortoise clearance surveys, fencing the perimeter of the substation site, and rough grading. SCE substation construction will include final grading of the site to substation specifications, installation of an 8-foot perimeter fence with tortoise fencing, installation of a ground grid, substation equipment installation, paving of internal driveways, and covering unpaved surfaces with crushed rock.

Two transmission line access areas, approximately 1,015 by 400 feet (approximately 9 acres) each, would be included within the proposed substation site outside the fenced substation perimeter. These areas would provide room for the 115-kV and 220-kV transmission lines to turn into the station from the adjacent ROWs. Ground disturbance within these areas by SCE construction would be limited to that needed for construction and access to the structure erection locations, staging/pulling areas, and unpaved access roads.

6. Site Cleanup

SCE would restore all areas that were temporarily disturbed by project activities, including temporary access routes, material staging yards, pulling and tension sites, splicing sites and tower removal and construction areas following the completion of construction. Restoration will take place according to the Reclamation, Restoration and Revegetation Plan (RRRP) to be developed for the project and would include grading, restoring sites to original contours, and reseeding or planting, where appropriate. In addition, all construction materials and debris would be removed from the area and recycled or properly disposed off site. SCE will monitor restoration for a given period after reclamation, to assure that cleanup activities were successfully completed and satisfactory reclamation was achieved. During construction, water trucks would be used to minimize the quantity of airborne dust created by construction activities. Any damage to existing roads as a result of construction would be repaired once construction was completed.

7. Operation and Maintenance

Transmission Line

Following the completion of EITP construction, operation and maintenance of the new lines would commence. Operation and maintenance activities would occur at least once per year, as required by current SCE Transmission Operations and Maintenance Policies and Procedures. SCE operations and maintenance activities are broken down into four classes:

1. Class 1 – Regular Maintenance Activities that do not involve ground or vegetation disturbances. Class 1 inspection and maintenance activities would include the following:
   - Routine line patrols by both aircraft and truck
   - Routine, patrol-identified structure and wire maintenance
   - Routine, patrol-identified earth and sand abatement from footings
   - Routine ROW road maintenance

2. Class 2 – Repairs of Existing Facilities that involve limited ground or vegetation disturbance. These activities include repairing or replacing poles and towers and re-stringing conductors, tree and brush trimming, and weed control. These are temporary impacts that may occur from time to time and would not result in a net disturbance of land beyond that estimated for the EITP project.

3. Class 3 – Installation of New Facilities not considered "routine," is considered new projects, and therefore is not covered in this consultation.

4. Class 4 – Emergency Repairs necessary to respond to emergency situations such as high winds, storms, wildfires and other natural disasters and accidents. They typically involve repairing downed lines, poles, and towers, or restringing conductors. Temporary impacts would be similar to construction of new facilities with respect to laydown areas, stringing, pulling, and tensioning.

Substations

Considering the EITP's specific features and the typical climate conditions of the proposed project area, the Ivanpah Substation would require 14 visits per year for operational activities, and 20 to 25 visits per year for maintenance.

Operation of the Ivanpah Substation would require use of electric, fuel, transportation, solid waste, and communication services. Electric service would be provided by the two distribution systems described under distribution lines. In addition, an emergency backup generator would be placed at the microwave communication site and would store 499 gallons of fuel.

Currently, SCE does not anticipate the need for a permanent water supply at the Ivanpah Substation during operations. The applicant is evaluating options for a portable or permanent self-contained restroom facility for use during operation and maintenance activities. Either restroom facility would have a self-contained holding tank or the wastewater would be disposed of by contract service personnel. During construction, the site would be serviced by portable restroom facilities and the wastewater would be disposed of weekly or more frequently depending on the number of construction personnel and usage. The physical location and type (portable or permanent) of self-contained restroom facilities would be determined during final engineering.

Solid waste handling and disposal procedures at the substation sites would be conducted as specified in the applicant's Waste Disposal Plan, the Salvage Services Manual, and the Waste

Management Manual. The applicant would manage, control, and dispose of all potentially hazardous materials generated as a result of project operations and maintenance in accordance with applicable regulatory requirements and standard procedures.

Specialized personnel would visit the new Ivanpah Substation to conduct routine maintenance activities. Current regular maintenance activities at the existing Eldorado Substation would also continue after the proposed upgrades. Other visits to the substation might be required to support repairs, outages, and other related work activities as required by maintenance, testing, and engineering personnel. The applicant would mobilize vehicles from other locations to the Ivanpah Substation for both routine and emergency maintenance activities, as required.

Telecommunication System

Maintenance personnel would conduct routine maintenance for the proposed telecommunication equipment and facilities, including the microwave communication site, the emergency generator, and the mechanical and electrical equipment room at the Ivanpah Substation. Additional visits to the telecommunication facilities may be necessary for repairs.

Routine maintenance to the telecommunication facilities at the Ivanpah Substation would be performed once a year. In addition, the following maintenance activities would be performed once a year at the proposed microwave site in Nipton:

- Telecom equipment
- Propane tank refuel (contractor)
- Air-conditioning service (contractor)
- Building maintenance (contractor)

8. Removal and Restoration

Prior to removal or abandonment of the facilities described above that would be permitted to be constructed on BLM lands or within a reasonable time following termination of the BLM ROW grant, SCE would prepare a RRRP. The RRRP would include a description of removal of SCE facilities from the permitted area, and any requirements for habitat restoration and revegetation. The RRRP would be approved by BLM before implementation.

9. Proposed Minimization Measures

BLM and SCE propose measures to avoid and minimize effects to desert tortoises and their habitat, described in detail in the BA and summarized below:

a. Authorized desert tortoise biologists will conduct preconstruction surveys according to the most current Service protocol (Service 2009).
b. Minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation will be flagged for avoidance.
c. Crews will use Best Management Practices where applicable.

d. Biological monitors will be provided throughout construction activities in all construction zones with the potential for presence of sensitive biological resources. Biological monitors will clear all active work sites ahead of construction crews. Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors.

e. A Worker Environmental Awareness Program will be prepared and presented to all workers.

f. Final tower and spur road locations will be adjusted to avoid sensitive biological resources to the greatest extent feasible.

g. An invasive plant management plan will be developed to reduce the potential for spreading invasive plant species during construction activities. The plan will be developed and modeled on the plan developed by BLM's Las Vegas Field Office.

h. All work area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or otherwise marked to minimize surface-disturbance activities. All workers will strictly limit activities and vehicles to the designated work areas.

i. Crushing of perennial vegetation in work areas will be avoided to the maximum extent practicable.

j. All trash and food items generated by construction and maintenance activities will be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens.

k. Pets will not be allowed in working areas unless restrained in a kennel.

l. Where possible, motor vehicles will be limited to maintained roads and designated routes.

m. Vehicle speed within the project area will not exceed 20 miles per hour. Speed limits will be clearly marked and all workers will be made aware of these limits.

n. Constructed road berms will be less than 12 inches in height and have slopes of less than 30 degrees.

o. Construction monitoring will employ a designated field contact representative (FCR) for the construction phase of the project. Authorized desert tortoise biologists will monitor all construction activities year-round in desert tortoise habitat, regardless of the time of year or weather conditions, as tortoises are often active outside their "active" season. The FCR and authorized biologists will have direct access to BLM and Service staff.

p. Water used for fugitive dust control will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

q. Any tortoise found on the surface will be relocated within 1,000 feet.

r. If a potential tortoise burrow were required to be excavated, the biologist will proceed according to Service protocol.

s. Steep-walled trenches or excavations will be covered during construction to prevent entrapment of tortoises. No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) will be left unfenced

or uncovered. Earthen escape ramps will be maintained at intervals of no greater than 0.25 miles.

t. Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with this biological opinion will be documented immediately by the biological monitor. The FCR will ensure that appropriate corrective action was taken, and will report to the BLM and Service.

u. Parked vehicles will be inspected prior to being moved.

v. Should any desert tortoise be injured or killed, all activities in the area will be halted, and the FCR and/or authorized desert tortoise biologist immediately contacted.

w. A report to the Service will be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises will be reported.

x. The applicant will implement a Raven Management Program.

y. The applicant will develop an RRRP that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. Post-construction monitoring will be performed for one to 5 years, depending on the disturbance level and restoration level as required by BLM.

z. If drainages cannot be avoided by infrastructure placement, then the applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.

aa. No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95 degrees Fahrenheit (35 degrees Celsius). No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95 degrees Fahrenheit before handling or processing can be completed. For translocation, captured tortoises may be held overnight and moved the following morning within these temperature constraints.

bb. During all handling procedures, desert tortoises must be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (e.g., gaping, foaming at the mouth, hyperactivity, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being.

cc. If a desert tortoise voids its bladder as a result of being handled, the animal shall be rehydrated.

dd. If a desert tortoise is injured as a result of project-related activities, it shall be immediately taken to an approved wildlife rehabilitation or veterinary facility.

Proposed compensation for habitat disturbance in California:

BLM compensation requirements for new disturbance in desert tortoise habitat is specified in the land use plans as 1:1 land replacement outside of designated critical habitat and 5:1 within designated critical habitat. The proposed project is expected to result in 49.7 acres of

disturbance to habitat not designated as desert tortoise critical habitat and 2.01 acres disturbance to designated desert tortoise critical habitat (DTCH). Therefore, compensation lands will equal 49.7 acres for the non-DTCH disturbance (1:1) and 10.05 acres for the DTCH disturbance (5:1).

The lands will be purchased either by the applicant or the applicant can deposit funds with the National Fish and Wildlife Foundation (NFWF) under the Renewable Energy Action Team (REAT) account governed by the REAT/NFWF memorandum of agreement (MOA). If funds are deposited with the NFWF, a compensation fee will be assessed based on current fair market appraised value for the specific geographic area in which the acquisition occurs. The acquired lands will occur in desert tortoise habitat with equivalent function and value. The replacement habitat is intended to benefit the population of desert tortoise adversely affected by the project. BLM, the Service, and CDFG will coordinate to reach mutual agreement on the selection and ownership/ management of acquired lands.

If funds are provided to NFWF, the (1) compensation funds will be provided prior to project construction, (2) lands will be acquired prior to completion of project construction, and (3) lands will be conserved in perpetuity by a legal mechanism agreed to by the three agencies. If conservation lands are acquired directly by the applicant, steps 2 and 3 will apply.

Regardless of the acquisition method (by applicant or NFWF), the applicant will establish a management fund for the agency that owns and manages the acquired lands. The management fund will consist of an interest-bearing account (as described in the REAT/NFWF MOA), with the amount of capital commensurate to generate sufficient interest to fund all monitoring, management, and protection of the acquired lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and other actions designed to protect or improve the habitat values of the acquired lands. A Property Analysis Record, as described at: http://cnlm.org/cms/index.php?option=com_content&task=view&id=21&Itemid=155 or comparable method, will be conducted by SCE and reviewed by BLM, the Service, and CDFG, to determine the management needs and costs described above, which then will be used to calculate the amount of capital needed for the management fund. This management fund will be held and managed by NFWF or another entity approved by BLM, the Service, and CDFG.

Proposed compensation for habitat disturbance in Nevada:

The EITP would disturb 220 acres of non-DTCH and 93.6 acres of DTCH in Nevada which included 8.8 acres of the BCCE. The applicant will pay compensation for disturbance of habitat prior to surface-disturbing activities associated with the proposed project. Disturbance of DTCH will be compensated at the current rate of $3,537 per acre (factor of 4.5 x base rate of $786). The multiplier used in this rate calculation was derived from Hastey *et al.* (1991), and consists of a multiplier of 3.0 for habitat quality (*i.e.,* critical habitat), plus

0.5 for growth-inducing effects of the project, plus 1.0 for long-term effects of the action (>10 years), resulting in a total factor of 4.5. The disturbance of non-DTCH will be compensated at $786 per acre of disturbance.

Fees for the 8.8 acres of disturbance of BCCE land shall be donated to the Clark County Desert Conservation Program to be applied towards costs associated with desert tortoise habitat enhancement within the BCCE, because this area is protected by the County for the benefit of desert tortoise and their habitat. The Federal agency or project proponent shall contact the Desert Conservation Program at the address below for specific instruction on submitting payment. The total fee for BCCE disturbance outside the BLM corridor is $6,916.80.

Clark County Desert Conservation Program
333 North Rancho, Suite 625
Las Vegas, Nevada 89106

Total remuneration fees to be paid to BLM for the project based on the current base rate of $786 per acres are $497,066.40 ($503,983.20- $6,916.80 for BCCE disturbance). These funds will be used for management actions expected to provide a benefit to the desert tortoise over time. Actions may involve habitat acquisition, population or habitat enhancement, increasing knowledge of the species biological requirements, reducing loss of individual animals, documenting the species' current status and trends, and preserving distinct population attributes. Specific actions to be funded will be determined during annual meetings between the BLM and Service to identify and prioritize management actions, which may include implementation of rangewide tortoise monitoring, and management of the Desert Tortoise Conservation Center (BLM and Service 2010).

The fee rate will be indexed for inflation based on the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U) on January 31st of each year. The next adjustment shall occur on January 31, 2012, and will become effective March 1, 2012. Fees assessed or collected for projects covered under this biological opinion after March 1st of each year will be adjusted based on the CPI-U. Information on the CPI-U can be found on the Internet at: http://stats.bls.gov/news.release/cpi.nws.htm.

These funds are independent of any other fees collected by BLM for desert tortoise conservation planning. The payment to BLM shall be accompanied by the attached Section 7 Land Disturbance Fee Payment Form (Appendix B), and completed by the payee.

C. Analytical Framework for the Service's Determinations

Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of

listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed Federal action, and any cumulative effects, on the rangewide survival and recovery of the desert tortoise. It relies on four components: (1) the Status of the Species, which describes the rangewide condition of the desert tortoise, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the desert tortoise in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the desert tortoise; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the desert tortoise; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the desert tortoise.

Adverse Modification Determination

Section 7(a)(2) of the Endangered Species Act also requires that Federal agencies ensure that any action they authorize, fund, or carry out does not result in the destruction or adverse modification of designated critical habitat. Our analysis of effects to desert tortoise designated critical habitat follows Service-issued guidance: *Application of the "Destruction or Adverse Modification" Standard under section 7(a)(2) of the Endangered Species Act* issued on December 9 2004. The guidance addresses the 9th Circuit Court of Appeals ruling in *Gifford Pinchot Task Force v U.S. Fish and Wildlife Service*, No. 03-35279 (August 6, 2004) and states that an evaluation of effects to designated critical habitat should consider the concepts embodied in the sections 3 (definitions of "critical habitat" and "conservation"), 4 (the procedures for delineating and adjusting areas included in a designation) and 7 (the substantive standard in paragraph (a)(2) and the procedures in paragraph (b)) and focus on the function and conservation role of both the affected CHU as well as the entire designation.

D. Status of the Species and Critical Habitat Rangewide

The rangewide status of the desert tortoise consists of information on its listing history, species account, recovery plan, recovery units, distribution, reproduction, and numbers. This information is dated September 23, 2010, and represents the current rangewide status of the desert tortoise and its critical habitat. This information is provided on the Service's website at: http://www.fws.gov/nevada/desert_tortoise/dt_life.html. If unavailable on this web site, contact the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230, and provide File No. 84320-2010-F-0448 along with the date of September 23, 2010.

E. Environmental Baseline

The action area is defined as all areas to be affected directly or indirectly by the Federal action, including interrelated and interdependent actions, and not merely the immediate area involved in the action (50 CFR § 402.02). Subsequent analyses of the environmental baseline, effects of the action, cumulative effects, and levels of incidental take are based upon the action area as determined by the Service. Regulations implementing the Act define the environmental baseline as the past and present effects of all Federal, State, or private actions and other human activities in the action area (50 CFR § 402.02). Also included in the environmental baseline are the anticipated effects of all proposed Federal projects in the action area that have undergone section 7 consultation, and the effects of State and private actions that are contemporaneous with the consultation in progress.

The action area for the EITP includes less than 100 acres of designated critical habitat. When critical habitat was designated in 1994, most of the action area occurred within an existing utility corridor with infrastructure. Desert tortoise habitat conditions in the action area are similar to those in 1994. Vegetation for shelter and to a lesser extent forage, have been removed from much of the utility corridor. Undisturbed designated critical habitat in the action area retains the Primary Constituent Elements (PCEs) of critical habitat as discussed below. The disturbed portion of the action area contributes toward recovery by providing space and habitat connectivity, allowing unobstructed tortoise movements across contiguous desert tortoise home ranges. Although the action area continues to provide habitat connectivity, tortoises that cross the disturbed ROW would be exposed to predators, particularly smaller tortoises.

1. Status of the Desert Tortoise in the Action Area

The desert tortoise is distributed throughout the action area with the exception of the dry lakes and developed areas as indicated by the presence of tortoise sign, including burrows, scats, tracks, bone elements, or other desert tortoise sign (BLM 2010).

Surveys for desert tortoise were conducted in the action area using the Service-approved protocol in the spring of 2008, 2009, and 2010 (EPG 2010). The surveys included the proposed transmission line alignment and ancillary facilities, the proposed telecommunication route, work areas, staging areas, and access roads. Results of desert tortoise surveys are provided in Appendix B of the BA, and summarized below.

Tortoise sign was observed along the route of the transmission line and telecommunication line, except for Ivanpah Dry Lake. In 2008 and 2009, a total of 304 tortoise sign were observed along the proposed routes, including 18 tortoises, 180 burrows, 74 scat, 20 carcasses or shell parts and 12 other types of sign (e.g., tracks, drinking depressions). Most of the sign was observed in three areas in Nevada: on the east side of the McCullough Range; on the northern edge of the Lucy Gray Mountains; and southeast of Roach Lake. In 2010, a total of 168 tortoise sign were observed, including 9 tortoises, 142 burrows, 2 scat, and 15 carcasses or shell parts.
An estimate of desert tortoise density for the transmission line area was calculated using the

100-percent coverage tortoise survey data from 2008 and 2009 with the tortoise density calculator in the Service survey guidance (Service 2009). Using this tool, tortoise density for the approximately 55.8 kilometer length of the proposed transmission line route was found to be approximately 2.0 tortoises per square kilometer. By comparison, desert tortoise density for the ISEGS Project located just north of the proposed EITP-Ivanpah Substation was estimated to be 1.4 tortoises per square kilometer. Because the tortoise density calculator uses only live tortoises located within the 100-percent survey coverage areas, an estimate can only be made for the proposed transmission route; tortoise density for the remaining project elements could not be estimated using the calculator.

We recognize that the survey data used for these estimates represents a single point in time and the number of individuals in these areas will change in response to environmental conditions. Efforts to accurately estimate the number of desert tortoises that may be encountered on long, linear projects such as the EITP are difficult. Variables that affect the number of tortoises that may occur or enter the ROW include habitat quality, season, temperature, and precipitation. All desert tortoises may not have been detected during the survey; some desert tortoises may die or may leave the proposed project area before construction of the proposed project commences; other unaccounted desert tortoises may move onto the site before construction begins; and undetected hatchling desert tortoises may emerge from rodent burrows or nests on, or adjacent to the ROW. However, the information above provides the best available data to establish a baseline for analysis.

Areas disturbed in the action area may contain desert tortoise nests with eggs. Based on studies performed in Ivanpah Valley and the Goffs study site in California that identified a sex ratio of 1:1 (Turner *et al.* 1984, Turner *et al.* 1987), we estimate that approximately half of the sub-adult and adult population is composed of reproductive females. However, it is difficult to estimate the number of eggs that may be within the proposed project area based on the number of reproductive females because: 1) some territories of female desert tortoises may extend beyond the proposed project area and their nests may be established outside the area; 2) fewer eggs may be present on the proposed project site at the time of construction depending on the time of the year; 3) the number of eggs that can be produced in a season is dependent on a variety of environmental and physiological factors; and 4) not all reproductive females produce eggs every year. Therefore, we are unable to estimate the number of eggs that may occur on the proposed project area.

Existing disturbances and impacts to desert tortoises in the action area include construction and continued use of major highways including Interstate 15, secondary roads, unimproved roads, trails, pipelines, Union Pacific Railroad, electrical transmission lines and substations, and utility corridors; recreational opportunities; casinos and retail businesses, a solar project and other facilities developed around Primm, Nevada. Developed areas cover about 12 percent of the action area and dry lake bed covers about 2.7 percent of the area (Karl 2010).

In addition, global climate change may affect recovery of the desert tortoise. The following information is summarized from the draft revised recovery plan for the desert tortoise (Service

2008). Global climate change and drought are potentially important long-term considerations with respect to recovery of the desert tortoise. Sufficient evidence exists that recent climatic changes have affected a broad range of organisms with diverse geographical distributions (Walther et al. 2002 in Service 2008). Although we do not have information regarding specific direct effects of climate change on the desert tortoise or its habitat, the Intergovernmental Panel on Climate Change has suggested a 3.5 to 4.0° C (6.3 to 7.2° F) increase in annual mean temperature, with the greatest increases occurring in summer (June-July-August mean up to 5° C (9° F) increase) (Christensen et al. 2007 in Service 2008). Precipitation likely will decrease by 5 to 15 percent annually in the region, with winter precipitation decreasing in the range of 5 to 20 percent (Christensen et al. 2007 in Service 2008).

Because germination of the desert tortoise's food plants is highly dependent on stable winter precipitation and temperature, the forage base could be reduced due to increasing temperatures and decreasing or unreliable precipitation during critical winter months. Winter precipitation in the Mojave Desert is much more reliable than the summer rains. One potential scenario is that the winter precipitation would shift to the north over time, leading to drier winters in the Mojave Desert, negatively impacting the growth of the spring annual plants. Spring annual plants, which are dependent on winter precipitation, provide essential forage for the desert tortoise. However, rainfall patterns may change in unpredictable ways, some areas may get wetter and other areas drier, with both situations altering desert tortoise habitat. Areas with increased rainfall would likely have increased growth of non-native, invasive species, altering the mixture of plants available for desert tortoise forage and changing the fire regime. Therefore, desert tortoise habitat may potentially change over the life of EITP due to climate change. Further predictions need to be developed specifically for the desert tortoise to help inform recovery efforts.

2. Status of the Critical Habitat in the Action Area

Desert tortoise critical habitat is composed of specific geographic areas that contain the PCEs of critical habitat, consisting of the biological and physical attributes essential to the species' conservation within those areas. The critical habitat within the action area is both undisturbed and disturbed as a result of previous power transmission and other projects.

Below are the specific PCEs of desert tortoise critical habitat and their status in the action area.

1. *PCE: Sufficient space to support viable populations within each of the six recovery units, and to provide for movement, dispersal, and gene flow.*

   Status: The action area is linear and includes areas disturbed by previous utility projects. Although the project area has been impacted by previous development, sufficient space occurs to allow tortoises to move freely within and across the action area.

2. *PCE: Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species.*

Status: Disturbances in the action area are mostly void of native plants important for desert tortoises. Undisturbed areas provide forage and proper soil conditions for tortoises.

3. *PCE: Suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites.*

   Status: Although suitable substrates occur in the disturbed portion of the action area, desert tortoise likely nest and shelter in undisturbed areas within the action area.

4. *PCE: Sufficient vegetation for shelter from temperature extremes and predators.*

   Status: This PCE occurs only in the undisturbed portion of the action area. Tortoises that use the disturbed area will be exposed to greater predation risk particularly from avian predators.

5. *PCE: Habitat protected from disturbance and human-caused mortality.*

   Status: Critical habitat within the designated utility corridors has little protection from disturbance; however, projects proposed with a Federal nexus include measures to reduce human-caused mortality during construction. The telecommunications component of the proposed action does not occur in a designated corridor and critical habitat here is afforded protection from major disturbances and human-caused mortality through BLM land use plans and designation as areas of critical environmental concern (ACEC) for tortoise conservation.

The vegetation present in critical habitat within the undisturbed action area at lower elevations is characteristic of creosotebush scrub with large portions dominated by creosotebush-white bursage (*Larrea tridentata-Ambrosia dumosa*). Other vegetation types include saltbush scrub, blackbrush scrub, blackbrush and Joshua tree woodland, and desert wash. Saltbush scrub consists of members of the genus *Atriplex* and other salt tolerant species. Blackbrush scrub dominated by blackbrush (*Coleogyne ramosissima*) is common at the upper elevations of the project. Some of this community is co-dominate with Joshua trees, indicative of Joshua tree woodland. Desert wash habitat can be found in many of the incised washes present throughout the action area and consists of ephedra (*Ephedra* sp.), cheesebush (*Ambrosia salsola*), and sweetbush (*Bebbia juncea*), with widely scattered catclaw acacia (*Acacia greggii*).

3. Factors Affecting the Species and its Critical Habitat in the Action Area

The Nevada portion of the transmission line corridor is predominantly on BLM lands, but the BCCE would be crossed near the Eldorado Substation lands, and private lands would be crossed at Primm, Nevada. Small segments of the telecommunications line action area crosses private parcels at Nipton, California. In Nevada, the Eldorado-Lugo line passes through the Piute-

Eldorado CHU and ACEC, and is located between, but does not cross, the South McCullough and Wee Thump Joshua Tree Wilderness Areas.

A portion of the transmission line corridor crosses the BCCE immediately south of Boulder City, which includes BLM ownership and private lands within Clark County and Boulder City, Nevada. The BCCE is an area conserved for desert tortoise recovery as mitigation for the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and Environmental Impact Statement (RECON 2000) and incidental take permit. The 2,000-foot-wide utility corridor occurs along its southernmost edge from the western side of the BCCE until it deviates outside of the BLM corridor in a southerly direction for less than 1 mile along an existing 70-foot ROW. The line then re-enters an adjacent 3,000-foot-wide corridor, continues to the northeast, and terminates at the Eldorado Substation (Figure 1).

The action area is primarily vacant and undeveloped with the exception of several high-voltage transmission lines and ancillary access roads that are located throughout the BLM designated utility corridor within which the new transmission line would be primarily located. The predominant land use in the action area for the Piute-Eldorado CHU is the existing utility corridors. In California only the telecommunications line crosses critical habitat (Ivanpah CHU). Other uses include casual off-highway vehicle (OHV) and recreation use, and other non-motorized recreation such as hiking, biking, and equestrian, sand and gravel extraction. Seasonal grazing occurs in the Ivanpah CHU but not the Piute-Eldorado CHU.

Several BLM permitted recreation events occur in the Jean/Roach Dry Lake area, which include competitive OHV races and other non-motorized specialized sport organized events. The existing utility roadways through the McCullough Range, including the North McCullough Pass, are used for some of these recreational activities. Casual OHV use and other recreational activities in the area are high.

a. Section 7 Consultations Affecting the Proposed Project Area

The following consultations address areas that overlap the action area addressed in this biological opinion.

- On November 25, 1997, the Service issued a Programmatic Biological Opinion (Service File No. 1-5-97-F-251) to BLM for implementation of various land management programs within the Las Vegas District planning area excluding desert tortoise critical habitat and ACECs, and outside the Las Vegas Valley. Activities proposed that may affect the desert tortoise in the action area include issuance of ROW, Recreation and Public Purposes leases, mineral material sales and leases, and mining plans of operation. The programmatic consultation is limited to activities which may affect up to 240 acres per project, and a cumulative total of 10,000 acres excluding land exchanges and sales. Only land disposals by sale or exchange in Clark County (but outside the Las Vegas Valley) are covered under the consultation up to a cumulative total of 14,637 acres. Thus,

a maximum total of 24,637 acres of desert tortoise habitat may be affected by the proposed programmatic activities.

- On June 18, 1998, the Service issued a Programmatic Biological Opinion (Service File No. 1-5-98-F-053) to BLM for implementation of various land management programs within desert tortoise habitat and the Las Vegas planning area, including desert tortoise critical habitat and ACECs. Activities that were proposed that may affect the desert tortoise in the action area include recreation; designation of utility corridors and mineral material extraction areas and designation of the Piute-Eldorado desert tortoise ACEC.

- On January 17, 2002, the Service issued a biological opinion to BLM regarding the effects to the desert tortoise of the implementation of the California Desert Conservation Area (CDCA) Plan (File No. 1-8-01-F-16). The biological opinion exempted incidental take for desert tortoises as a result of proposed activities including livestock grazing, management of burros, entrapment of desert tortoises in managed waters and guzzlers, and casual use associated with recreation and mining. Although the biological opinion did not anticipate a specific level of injury or mortality that would likely occur due to these activities, it required BLM to reinitiate consultation if more than five desert tortoises were killed or injured during any 12-month period. Due to a court challenge, the Service issued another biological opinion on the CDCA Plan on March 31, 2005 (File No. l-8-04-F-43R). The new biological opinion did not change the threshold for reinitiation of consultation identified in the 2002 biological opinion. The action area for the California portion of the EITP is located within the planning area considered in both CDCA consultations.

- On October 1, 2010, the Service's Ventura Field Office issued a biological opinion to BLM's Desert District for a proposed ROW for the BrightSource Energy ISEGS Project in San Bernardino County, California. Electrical energy generated by the ISEGS Project would be transmitted by EITP infrastructure. The ISEGS Project would involve construction, operation, maintenance, and decommissioning of a 370-megawatt solar thermal power plant and associated infrastructure and facilities on public land managed by BLM. The project would be constructed over a 4-year period and consist of three solar electric generating plants and associated infrastructure including the Ivanpah Substation which would be the southwestern terminus of the EITP. The Service anticipates that 3,322 acres of long-term and 122 acres of short-term disturbance of tortoise non-critical habitat would occur as a result of the project. The Service determined that 32 sub-adult/adult tortoises would be displaced and up to 9 killed or injured as a result of the ISEGS Project.

During initial desert tortoise surveys for Phase I of the ISEGS Project, more desert tortoises were found that anticipated in the biological opinion. Consequently, on February 24, 2011, BLM requested reinitiation of consultation for the project. As of April 15, 2011, reports account for 35 desert tortoises that have been handled on the project. The EITP will become part of the environmental baseline for the ISEGS Project during the reinitiation of consultation.

b. Habitat Conservation Plans

Since the Mojave population of the desert tortoise was first listed under the Endangered Species Act in 1989, three regional-level habitat conservation plans (HCPs) have been implemented for development of desert tortoise habitat in Clark County, Nevada. Approximately 89 percent of Clark County consisted of public lands administered by the Federal government, thereby providing little opportunity for mitigation for the loss of desert tortoise habitat under an HCP on non-Federal lands. Alternatively, funds are collected under HCPs and spent to implement conservation and recovery actions on Federal lands as mitigation for impacts that occur on non-Federal lands. Lands managed by BLM are included in these areas where mitigation funds are used to promote recovery of the desert tortoise. Actions taken in relation to the HCPs mentioned here are/were taken in areas that overlap the action area addressed in this biological opinion.

On November 22, 2000, the Service issued an incidental take permit (TE-034927) to Clark County, Nevada, including cities within the County and Nevada Department of Transportation (NDOT). This HCP is the only regional HCP in place that overlaps the action area. The incidental take permit allows incidental take of desert tortoise for a period of 30 years on 145,000 acres of non-Federal land in Clark County, and within NDOT rights-of-way, south of the 38th parallel in Nevada. The MSHCP and Environmental Impact Statement (RECON 2000), serves as the permittees' HCP and details their proposed measures to minimize, mitigate, and monitor the effects of covered activities.

As partial mitigation under the MSHCP, the County purchased a conservation easement from the City of Boulder City in 1994. The term of the BCCE is for 50 years and it will be retained in a natural condition for recovery of the desert tortoise and conservation of other species in the area. Certain uses shall be prohibited within the BCCE including motor vehicle activity off designated roads, livestock grazing, and any activity that is inconsistent with the purposes of the BCCE. Much of the BCCE is also designated desert tortoise critical habitat. Within the boundary of the BCCE, Boulder City reserved the Solar Energy Zone for energy development projects in addition to adjacent energy generation facilities described previously.

F. Effects of the Proposed Action on the Desert Tortoise and its Designated Critical Habitat

1. Desert Tortoise

Direct effects are the immediate, often obvious effect of the proposed action on the desert tortoise or its designated critical habitat. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. (50 CFR. § 402.02). In contrast to direct effects, indirect effects can often be more subtle, and may affect desert tortoise populations and habitat quality over an extended period of time, long after project activities have been completed. Indirect effects are of particular concern for long-lived species such as the desert tortoise, because project-related effects may not become evident in individuals or populations until years later.

Project activities could result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Desert tortoises may take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved. Other direct effects could include individual desert tortoises or their eggs being crushed or entombed in burrows. Desert tortoises may be collected or vandalized. Open excavations for tower foundations or trenches for underground fiber-optic installation may create a trap hazard for tortoises. Construction or operation of facilities may disrupt behavior due to noise or vibrations from the heavy equipment; lead to injury or mortality from encounters with workers' pets; and trash that may attract predators such as ravens and coyotes. Desert tortoises may also be attracted to the construction area by application of water to control dust, placing them at higher risk of injury or mortality. Desert tortoises found in harm's way will be moved a safe distance (e.g., less than 1,000 feet) but will not be translocated as a result of the project. Measures proposed by BLM should ensure these potential effects are minimized or avoided, which include: (1) preconstruction clearance surveys, (2) project monitors, (3) worker education, (4) speed limits, (5) covering trenches and other excavations, and (6) checking underneath vehicles.

Capturing, handling, and moving desert tortoises from harm's way would result in harassment and may also result in death or injury. Desert tortoises may die or become injured by relocation if these methods are performed improperly, particularly during extreme temperatures, or if they void their bladders. No desert tortoise will be translocated outside of their home ranges as a result of the proposed action. Averill-Murray (2001) determined that desert tortoises that voided their bladders during handling had significantly lower overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of appropriate protective measures and procedures, such as reused latex gloves, pathogens may be spread among the desert tortoises. If burrows are not properly excavated, desert tortoises may be killed or injured. Measures proposed by BLM should ensure these potential effects are minimized or avoided, which include: (1) Service-approved guidelines are followed when desert tortoises are handled or removed from burrows, and (2) authorized desert tortoise biologists will be responsible for handling tortoises.

Transmission poles would provide perching and nesting opportunities for ravens. Natural predation rates may be altered or increased when natural habitats are disturbed or modified. Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in the Mojave Desert prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (BLM 1990). BLM proposes to implement the Raven Management Plan (Appendix A) to minimize potential effects of ravens which will include raven monitoring and nest removal when appropriate. Human activities may provide food in the form of trash and litter or water that attracts desert tortoise predators such as the common raven, desert kit fox, feral dogs, and coyote (Berry 1986; BLM 1990). In addition to ravens, feral dogs have emerged as significant predators of the tortoise. Feral dogs may range several miles into the desert and have been found digging up and killing desert tortoises (Service 1994, Evans 2001). Domestic dogs brought to the project site by visitors may harass, injure, or kill desert tortoises, particularly if allowed off leash to roam freely in occupied desert tortoise habitat (Service 1994, Evans 2001). BLM proposes to prohibit roaming pets and remove trash and food from work areas to minimize this threat.

The project would result in disturbance of 269.7 acres of non-DTCH (Table 1) which includes 75 acres of disturbance within the BCCE. A portion of the telecommunication line and Eldorado-Lugo transmission line, and the microwave tower occur within the Ivanpah and Piute-Eldorado DWMAs. The Ivanpah DWMA was established by BLM in their Northern and Eastern Mojave Plan (BLM 2002) and the Piute-Eldorado DWMA was established by the 1998 Las Vegas District BLM Resource Management Plan (RMP). Removal of habitat and the activities associated with that disturbance within the home range of a desert tortoise would likely result in stress that could result in loss of health, increased risk of predation, reduced reproduction, and death. Measures proposed by BLM should ensure these potential effects are minimized or avoided, which include: (1) flagging native vegetation for avoidance, (2) locating towers and spur roads to avoid sensitive resources, (3) marking or flagging work areas, and restricting work activities to these areas, (4) avoiding damage to perennial vegetation where possible, (5) restoring disturbed habitat, and (6) providing project oversight through monitors, biologists, and field contact representatives (FCRs).

Direct mortality of tortoises by construction traffic on access roads or tower spurs could occur. During the construction period, there would be heavy traffic, including small and large trucks, bulldozers, and other construction vehicles on access and spur roads, at tower sites, and at pulling and tensioning sites. Equipment used to create new spur roads and tower pads could crush tortoises, or collapse dens. Use of water for dust-control or other project-related activities may attract desert tortoises to work areas. Any tortoise in these areas during construction would be at risk for take. This could be aggravated by the presence of water not normally available to tortoises, which may be used for dust control or cleaning of equipment. Construction debris and hazardous materials products that come in contact with desert tortoises could have serious or fatal effects. Measures proposed by BLM should ensure these potential effects are minimized or avoided, which include: (1) requiring workers to attend a worker education and awareness program (WEAP), (2) providing project oversight through monitors, biologists, and FCRs,

(3) marking or flagging work areas, and restricting work activities to these areas, (4) locating towers and spur roads to avoid sensitive resources, (5) conducting pre-construction clearance surveys, and (6) not allowing water to pool and repairing leaks on water trucks.

New access roads or tower spurs would increase access to tortoise habitat by the public which could result in harassment, crushing or collection of tortoises, collapse of burrows, compaction and erosion of soils, and proliferation of weeds, including grasses that can fuel wildfires. Wildfires likely remove the native plant community and provide suitable conditions for colonization by non-native invasive plant species, which could compete with native plant species of value to tortoise for forage and cover, and may increase the risk of future fires. Construction activities and operation and maintenance activities could result in accidental fires that spread into adjacent desert tortoise habitat. Accidental fires associated with project construction, such as those resulting from discarded smoking materials or equipment-induced fires, could be fatal to or result in loss of forage and shelter for desert tortoises. Measures proposed by BLM should ensure these potential effects are minimized or avoided, which include: (1) requiring workers to attend WEAP training, (2) restoring temporary disturbances, and (3) implementing an Invasive Weed Management Plan.

BLM is proposing to require compensation for implementation of raven management actions and additional compensation for loss of habitat, and acquisition of private lands containing desert tortoise habitat. Although acquisition of suitable desert tortoise habitat through these compensation requirements will not create new habitat, it will result in a net increase in the amount of desert tortoise habitat managed for the conservation of this species. In addition, the funding of management actions and regional management of common ravens is likely to result in restoration and rehabilitation of degraded habitat, protection of existing habitat from future sources of degradation, and a reduction in the direct mortality of desert tortoises. In general, the actions proposed with project compensation are identified in the original and draft revised recovery plans (Service 1994, 2008) and memorandum of understanding between the BLM and Service (BLM and Service 2010) as being necessary for the recovery of the desert tortoise.

2. Critical Habitat

The Nevada portion of the transmission line passes through approximately 11.3 miles of DTCH within the Piute-Eldorado CHU eastward from the McCullough Range summit, and the telecommunication route passes through approximately 14.1 miles of DTCH within the same CHU east of the McCullough Range. The California segment of the transmission line does not pass through DTCH; however, a section of the telecommunications line and the microwave tower at Nipton cross DTCH within the Ivanpah CHU.

Project equipment may compact soils and transport weeds into the project area where they may become established, thus reducing the capability of critical habitat to serve its role for recovery of the tortoise. Additionally, the introduction of noxious weeds may lead to increased wildfire risk (Brooks *et al.* 2003). Measures proposed by BLM to restore disturbances, and develop and implement a weed management plan should minimize or avoid these potential effects.

3. Effect on Recovery

The proposed project would result in displacement of approximately 28 desert tortoises, injury or mortality of two desert tortoises, impact desert tortoise habitat, including critical habitat, and traverse priority conservation areas identified in the 1994 Recovery Plan and 2008 draft revision. However, we do not anticipate the proposed project would impede the recovery potential of the species because: (1) the impacts would mostly occur within an existing utility corridor degraded by construction and operation and maintenance of existing utility infrastructure, (2) the project would not result in additional habitat fragmentation, (3) less than 0.02 percent of the Piute-Eldorado CHU in Nevada and approximately 0.0003 percent of the Ivanpah CHU in California will be impacted,[1] and (4) raven impacts would be monitored and managed to ensure than the project will not result in an increase in ravens in the action area. We anticipate that few, if any, adult desert tortoises will be lost due to project actions in consideration of the conservation measures proposed by the BLM and that the small number that may be lost will not impede the recovery potential of the species. Given the difficultly in detecting eggs and hatchlings, we anticipate that most eggs and hatchlings in the areas to be disturbed would be lost due to project activities. The size and scope of the proposed action and its footprint is relatively small when compared to the range of the species, thus this loss would not impede the recovery potential of the species.

The project would result in disturbance of 95.6 acres of DTCH (Table 1). Of this, 13.4 acres will be long-term ("permanent") and 82.2 acres will be temporary disturbance; temporary disturbance will be rehabilitated. The PCEs of critical habitat that provide forage, shelter, and nesting conditions for tortoises will be removed from the undisturbed portion of the action area; however, if proposed restoration is successful and precipitation levels are sufficient to promote vegetation growth these PCEs should return in 5 to 10 years. If precipitation is below average levels, the PCEs may not return for decades. Substantial adverse effects to critical habitat essential for movement, dispersal, and gene flow are not expected because desert tortoises readily move across dirt access and spur roads beneath utility lines, and ample adjacent suitable habitat is available along the transmission and telecommunication line alignments.

G. Cumulative Effects

Cumulative effects are those effects of future non-Federal (State, tribal, local government, or private) activities that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

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[1] Critical habitat for the desert tortoise consists of approximately 6.4 million acres in portions of the Mojave and Colorado deserts. The designation includes primarily federal lands in southwestern Utah, northwestern Arizona, southern Nevada, and southern California (59 FR 5820). The Piute-Eldorado CHU (in Nevada) and the Ivanpah CHU (in California) total approximately 1,149,200 acres of designated critical habitat.

Table 1. Anticipated New Disturbance of Desert Tortoise Critical Habitat (DTCH) and Non-DTCH

Desert Tortoise Habitat	Telecommunication Route			Transmission Line Route			Project Total		
	Temporary (Acres)	Long-term (Acres)	Subtotal (Acres)	Temporary (Acres)	Long-term (Acres)	Subtotal (Acres)	Temporary (Acres)	Long-term (Acres)	Total (Acres)
DTCH in California	**1.78**	**0.23**	**2.01**	**0.0**	**0.0**	**0.0**	**1.78**	**0.23**	**2.01**
DTCH in Nevada	**13.5**	**0.00**	**13.5**	**66.9**	**13.2**	**80.1**	**80.4**	**13.2**	**93.6**
Total DTCH	*15.3*	*0.23*	*15.5*	*66.9*	*13.2*	*80.1*	*82.2*	*13.4*	*95.6*
Non-DTCH in California	**0.02**	**0.0**	**0.02**	**43.7**	**6.0**	**49.7**	**43.7**	**6.0**	**49.7**
Non-DTCHt in Nevada	**11.6**	**0.0**	**11.6**	**186.0**	**22.4**	**208.4**	**197.6**	**22.4**	**220.0**
Total Non-DTCH	*11.6*	*0.00*	*11.6*	*229.7*	*28.4*	*258.1*	*241.3*	*28.4*	*269.7*
Total California	*1.8*	*0.23*	*2.03*	*43.7*	*6.0*	*49.7*	*45.5*	*6.23*	*51.7*
Total Nevada	*25.1*	*0.0*	*25.1*	*252.9*	*35.6*	*288.5*	*278.0*	*35.6*	*313.6*
Grand Total	26.9	0.23	27.1	296.6	41.6	338.2	323.5	41.8	365.3

Projects that do not have a Federal nexus include four proposed solar energy facilities on Boulder City, Nevada lands and a small mining operation. The four proposed solar sites would comprise a total of approximately 8,692 acres and the mine site is 15 acres.

Increased development would cause continued habitat loss, degradation, and fragmentation for the local desert tortoise population; as well as increased harm and harassment of individual desert tortoises, contributing to the cumulative degradation of the area. Planned future actions such as future industrial solar power plants would likely continue this trend. However, we know of no specific proposal by any non-Federal entity in the action area. The Service determined that most other future actions in the action area would likely require section 7 consultation since the action area is managed by BLM, a Federal agency.

H. Conclusion

After reviewing its status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise nor is not likely to adversely modify designated critical habitat for the desert tortoise. We have reached this conclusion because:

1. Numerous measures will be implemented by BLM to ensure that most tortoises are located and moved out of harm's way and potential desert tortoise injury and mortality is minimized on project work sites (i.e., clearance surveys, authorized desert tortoise biologists, desert tortoise monitors, etc.).

2. The number of desert tortoises to be injured and killed as a result of the project will likely be small (i.e., one during construction and one during operation and maintenance activities) relative to the number of desert tortoises that occur across the range of the species. No tortoises will be translocated beyond their home ranges and those moved from harm's way should remain in the wild with only short-term adverse effects.
3. A raven management plan will be implemented to reduce the potential for increased predation by common ravens.

4. The potential spread of non-native plant species will be minimized through a proposed invasive weed management plan.

5. This project would not result in a substantial increase in fragmentation of desert tortoise habitat; sufficient habitat will remain to provide connectivity of tortoise habitat.

6. PCEs of critical habitat will be adversely affected but not to the extent they will no longer function within the affected CHU or reduce the capability of the CHU to support the current number of tortoises in the CHU; temporary disturbances will be restored.

7. Compensation requirements through BLM will be a beneficial effect to the desert tortoise and will result in an increase in the quantity and quality of habitat managed for the

conservation of the desert tortoise including restoration of lost or degraded habitat within these areas.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the Terms and Conditions of an incidental take statement.

The measures described below are nondiscretionary and must be implemented by BLM, or other jurisdictional Federal agencies, so that they become binding conditions of any project, contract, grant, or permit issued by BLM as appropriate, in order for the exemption in section 7(o)(2) to apply. The Service's evaluation of the effects of the proposed actions includes consideration of the measures developed by BLM, and repeated in the *Description of the Proposed Action* portion of this biological opinion, to minimize the adverse effects of the proposed action on the desert tortoise. Any subsequent changes in the minimization measures proposed by BLM, or other jurisdictional Federal agencies, may constitute a modification of the proposed action and may warrant reinitiation of formal consultation, as specified at 50 CFR § 402.16. These Reasonable and Prudent Measures are intended to clarify or supplement the protective measures that were proposed by BLM as part of the proposed action.

BLM, and other jurisdictional Federal agencies, have a continuing duty to regulate the activities covered by the Incidental Take Statement in the biological opinion. If BLM , or other jurisdictional Federal agencies, fail to include the Terms and Conditions of this Incidental Take Statement as enforceable conditions of its discretionary action, the protective coverage of section 7(o)(2) may lapse. To monitor the effect of incidental take, BLM must report the progress of its action and its effects on the desert tortoise to the Service as specified in the Incidental Take Statement [50 *Code of Federal Regulations* 402.14(i)(3)].

A. Amount or Extent of Take Anticipated

Based on the scope of the proposed action, the desert tortoise survey data, analysis of impacts provided above, measures proposed by BLM, and the anticipated project duration, the Service anticipates that the following take could occur as a result of the proposed action:

1. We estimate that approximately 28 desert tortoises are anticipated to be captured and relocated during construction of the project. If the number of tortoises encountered and moved reaches our estimate, BLM shall notify the Service at which time we will evaluate the risk of injury and mortality to tortoises and determine if any additional measures are appropriate. We anticipate desert tortoises moved from harm's way will remain in their home range as part of the affected tortoise population.

2. No more than two (2) adult, sub-adult, or juvenile desert tortoise, and an unknown number of undetected hatchling tortoises are anticipated to be killed or injured during project construction activities.

3. An unknown number of desert tortoises will be taken in the form of indirect mortality through predation by ravens or other subsidized predators drawn to the project area. We anticipate this number will be small considering the raven management plan should ensure that raven numbers will not increase as result of the project, and surveys conducted to date do not indicate that ravens use the existing transmission facilities that would be replaced by the proposed project.

4. Following project construction, the Service estimates that no more than one desert tortoise will be accidentally injured or killed for maintenance and operation activities including travel on access roads.

5. An unknown number of tortoise eggs in one nest may be destroyed or relocated as a result of project activities.

B. Effect of Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take will not jeopardize the continued existence of the desert tortoise.

Our evaluation of the proposed action includes consideration of the protective measures described in the Description of the Proposed Action section of the accompanying biological opinion. Consequently, any changes in these protective measures may constitute a modification of the proposed action that causes an effect to the desert tortoise that was not considered in the biological opinion and requires reinitiation of consultation, pursuant to the implementing regulations of the section 7(a)(2) of the Act (50 CFR § 402.16).

C. Reasonable and Prudent Measures with Terms and Conditions

The Service believes that the Reasonable and Prudent Measures (RPMs) below are necessary and appropriate to minimize take of desert tortoises. In order to be exempt from the prohibitions of section 9 of the Act, BLM, or other jurisdictional Federal agencies, must ensure full compliance with Terms and Conditions, which follow and implement the RPMs below. These conditions are non-discretionary.

RPM 1: *The BLM, or other jurisdictional Federal agencies as appropriate, shall ensure that desert tortoises in harm's way are located, properly handled, and moved to safety; other measures will be in place to avoid and protect tortoises within the action area but not in harm's way.*

Terms and Conditions:

1.a. A desert tortoise education program shall be presented to all personnel onsite during construction activities. This program will contain information concerning the biology and distribution of the desert tortoise, its legal status and occurrence in the proposed project area, the definition of take and associated penalties, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when desert tortoises are encountered.

1.b. Authorized desert tortoise biologists and designated FCR shall be onsite during all construction activities to ensure compliance with this biological opinion, including avoidance of inadvertently harming any desert tortoises that may wander onto the construction site. The FCR and authorized biologists will have direct access to BLM and Service staff. The authorized desert tortoise biologist and FCR shall be responsible for: (1) enforcing the litter-control program; (2) ensuring that desert tortoise habitat disturbance is restricted to authorized areas; (3) ensuring that all equipment and materials are stored within the boundaries of the construction zone or within the boundaries of previously-disturbed areas or designated areas; (4) ensuring that all vehicles associated with construction activities remain within the proposed construction zones; and (5) ensuring compliance with the Terms and Conditions of this biological opinion.

The authorized desert tortoise biologist shall also capture, handle, and relocate tortoises from harm's way in accordance with the Desert Tortoise Field Manual (Service 2009). Potential authorized biologists must submit their statement of qualifications to the Service's Nevada Fish and Wildlife Office and CDFG for approval, allowing a minimum of 30 days for Service response. The form is available on the internet at:
http://www.fws.gov/nevada/desert_tortoise/auth_dt_form.htm

1.c. Prior to surface-disturbing activities, an authorized desert tortoise biologist potentially assisted by project monitors, shall conduct a clearance survey to locate and remove desert tortoises using techniques providing full coverage of all areas. Two passes of complete coverage will be accomplished. All desert tortoise burrows, and other species burrows that may be used by desert tortoises, will be examined to determine occupancy of each burrow by desert tortoises. Any desert tortoises or eggs found in the project footprint will be relocated offsite by an authorized desert tortoise biologist in accordance with approved protocol (Service 2009). Desert tortoise burrows that occur immediately outside work areas that can be avoided by project activities shall be clearly marked or flagged to prevent crushing.

1.d. All burrows found within areas proposed for disturbance, whether occupied or vacant, shall be excavated by an authorized desert tortoise biologist and collapsed or blocked to prevent desert tortoise re-entry. All burrows will be excavated with hand tools to allow removal of desert tortoises or desert tortoise eggs. All desert tortoise handling and excavations, including nests, will be conducted by an authorized desert tortoise biologist in accordance with Service-approved protocol (Service 2009).

1.e. All located desert tortoises in harm's way shall be relocated to safe areas up to 1,000 feet from the point of capture. Desert tortoises found aboveground will be placed under a bush in the shade. A desert tortoise located in a burrow will be placed in an existing unoccupied burrow of the same size and orientation as the one from which it was taken. If a suitable natural burrow is unavailable or the occupancy status of the burrow is in question, a qualified desert tortoise biologist will construct one of the same size and orientation as the one from which it was removed using the protocol for burrow construction (Service 2009).

Desert tortoises shall be handled according to Service-approved protocol (Service 2009) which includes instruction for tortoise encounters during high temperatures. If a tortoise is injured as a direct or indirect result of project activities, it shall be immediately transported to a veterinarian or wildlife rehabilitation facility such as the Desert Tortoise Conservation Center in Las Vegas.

1.f. Any desert tortoise found within one hour before nightfall shall be placed in a separate, clean cardboard box and held in a cool, predator-free location. The box will be covered and kept upright at all times to minimize stress to the tortoise. Each box will be used once and then disposed properly. The desert tortoise will be released the next day in the same area from which it was collected and using the procedures described above. Each desert tortoise will be handled with new disposable latex gloves. After use, the gloves will be properly discarded and a fresh set used for each subsequent desert tortoise handling.

1.g. Project activities that may endanger a desert tortoise shall cease if a desert tortoise is found on the project site. Project activities will resume after an authorized desert tortoise biologist removes the desert tortoise from danger or after the desert tortoise has moved to a safe area.

1.h. If a tortoise is found, the authorized desert tortoise biologist, monitor, or FCR shall inform workers in the area to be particularly watchful for the tortoise as it may return to the work area.

1.i. Final tower and spur road locations will be adjusted to avoid potentially active tortoise burrows to the greatest extent feasible.

1.j. Areas underneath parked project vehicles and equipment will be inspected for desert tortoises before moving them.

1.k. Steep-walled trenches or excavations will be monitored, covered, or fenced to exclude all tortoises during construction to prevent entrapment of tortoises.

1.l. Vehicle speed within the project area will not exceed 20 miles per hour. Speed limits will be clearly marked and all workers will be made aware of these limits.

1.m. Water used for fugitive dust control will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

1.n. Should any desert tortoise be injured or killed, all activities in the area will be halted, and the FCR and/or authorized desert tortoise biologist immediately contacted, who will notify the appropriate office of the Service.

RPM 2: *The BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to minimize predation on desert tortoises by ravens or other desert tortoise predators attracted to the project area.*

Terms and Conditions:

2.a. A litter control program shall be implemented to reduce the attractiveness of the area to opportunistic predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed properly in predator-proof containers with re-sealing lids. Trash containers will be emptied and construction waste will be removed daily from the project area and disposed of in an approved landfill.

2.b. Dogs will be prohibited in all project work areas.

2.c. BLM shall ensure that the Raven Management Plan is implemented (Appendix A).

RPM 3: *The BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to minimize loss and long-term degradation of desert tortoise habitat, such as soil compaction, erosion, crushed vegetation, or introduction of non-native invasive plants or weeds as a result of project activities.*

Terms and Conditions:

3.a. Perennial native vegetation will be flagged and avoided to the extent feasible.

3.b. Cross-country travel and travel outside designated access roads and project construction areas shall be prohibited.

3.c. Prior to surface-disturbing activities associated with the proposed project, BLM shall ensure that all compensation commitments for habitat disturbance, in the Description of the Proposed Action of this biological opinion are fulfilled by the applicant. For disturbance in Nevada, the applicant shall submit fee payment with the fee payment form (Appendix B).

3.d. The applicant will salvage and relocate cacti, and yuccas for onsite and offsite restoration efforts as directed by the BLM.

3.e. All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain within the ROW, existing roads, and designated areas. Staging areas will be located in previously-disturbed areas whenever possible.

3.f. The applicant will develop an RRRP that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. Post-construction monitoring will be performed annually unless BLM determine less frequent monitoring is appropriate.

3.g. An Invasive Plant Management Plan will be developed and implemented. The plan will be modeled on BLM's Las Vegas Office DRAFT Weed Plan (BLM 2006).

RPM 4: *The BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to ensure compliance with the Reasonable and Prudent Measures, Terms and Conditions, reporting requirements, and reinitiation requirements contained in this biological opinion.*

Terms and Conditions:

4.a. The authorized desert tortoise biologist shall record each observation of desert tortoise handled. Information will include the following: location (GPS), date and time of observation, whether desert tortoise was handled, general health and whether it voided its bladder, location desert tortoise was moved from and location moved to, and unique physical characteristics of each tortoise. Reports documenting effectiveness and compliance with the desert tortoise protection measures will be prepared and submitted to appropriate agencies every 6 months.

The reporting requirements would include the submission of an assessment after construction is completed. The report would outline the schedule that was followed for implementing the minimization measures as well as biological observations (as stated above) and the general success of each of the minimization measures and the maintenance activities that occurred over that period.

A final report will be submitted to the Service's Las Vegas and Ventura offices within 90 days of completion of construction of the project. An annual report regarding the effects of the operation and maintenance of EITP on the desert tortoise and the results of the raven monitoring program will be submitted to these offices by January 31 of each year.

4.b. Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with this biological opinion will be documented immediately by the authorized desert tortoise biologist. The FCR will document the incident in the report in Term and Condition 4.a. along with the appropriate corrective action taken.

D. Reporting Requirements

Upon locating a dead or injured desert tortoise within the action area, notification must be made to the Service's Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230. Care should be taken in handling sick or injured desert tortoises to ensure effective treatment and in handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of injured desert tortoises or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by the Service to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed. All deaths, injuries, and illnesses of desert tortoises, whether associated with project activities or not, will be summarized in an annual report.

The following actions should be taken for injured or dead desert tortoises if directed by the Service:

1. Injured desert tortoises shall be delivered to any qualified veterinarian for appropriate treatment or disposal.

2. Dead desert tortoises suitable for preparation as museum specimens shall be frozen immediately and provided to an institution holding appropriate Federal and State permits per their instructions.

3. Should no institutions want the desert tortoise specimens, or if it is determined that they are too damaged (crushed, spoiled, *etc.*) for preparation as a museum specimen, then they may be buried away from the project area or cremated, upon authorization by the Service.

4. BLM, or other jurisdictional Federal agencies as appropriate, shall bear the cost of any required treatment of injured desert tortoises, euthanasia of sick desert tortoises, or cremation of dead desert tortoises.

5. Should sick or injured desert tortoises be treated by a veterinarian and survive, they may be transferred as directed by the Service.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service suggests the following conservation recommendations:

- *BLM should continue to protect and manage desert tortoise ACECs and critical habitat for recovery and equally protect and conserve habitat that connects these important areas.*
- *BLM should work with power companies to include structure designs that minimize raven perching and nesting substrate.*

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in your August 16, 2010, request. As required by 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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Appendix A. Raven Management Plan

Raven Management Plan (RMP): There is a potential for predation increase on the desert tortoise (DT) and other sensitive species by common ravens exploiting transmission towers for perching, roosting, and nesting. SCE will implement a Raven Management Plan (RMP) to minimize avian predation on DT for the Eldorado-Ivanpah Transmission Project (EITP, project). The purpose of the RMP is to utilize methods to deter raven depredation of juvenile desert tortoises, and other wildlife species. The RMP is not intended to eliminate or control raven populations, rather to target offending ravens that have been found to prey upon the DT. The RMP will incorporate an adaptive management strategy for immediate implementation following EITP construction. The RMP will be evaluated after years of monitoring or as needed, depending on the survey findings and field conditions, or if avian predation becomes apparent. The following activities will be implemented as part of the RMP: (1) *Common Raven Nest/Power line Monitoring*, and (2) *Raven Control Contribution*. Mutual and timely cooperation between SCE and the Bureau of Land Management (BLM), U.S. Fish & Wildlife Service (USFWS) and state wildlife agencies (California Department of Fish and Game [CDFG] and Nevada Division of Wildlife [NDOW]) is central to effective implementation of the RMP.

Common Raven Nest/Power Line Monitoring: The name and qualifications of a Qualified Biologist(s) will be submitted to the BLM, USFWS, CDFG and NDOW for approval 30 days prior to commencement of monitoring each year. A Qualified Biologist(s) or USFWS/State approved SCE designee with expertise identifying common raven nests and DT sign in DT modeled*, critical, and occupied habitat will conduct:

- Nest surveys will be performed once per month, between the 15th and last day of each month, during the primary common raven nest building period (February to May) and will begin the first common raven nesting season following the completion of construction in DT habitat. In the event that a common raven is documented initiating a new nesting attempt during the May surveys, follow up visits to that nest will be made in the subsequent months to establish whether or not the pair is bringing DT back to the nest. Surveying once per month is expected to identify potential nests prior to hatching of chicks, considering an incubation time of approximately 4 - 5 weeks. Nest removal by SCE would occur at the time of offending raven removal, depending upon impacts to personnel safety or system reliability. If eggs or chicks are found in a removed nest, the eggs or chicks would be humanely disposed.
- Surveys for the presence of common raven nests on EITP tower structures and for the presence of DT remains within a 15-meter radius of each tower. Nest survey methods may include aerial surveys, vehicular windshield surveys or pedestrian surveys as appropriate.
- If DT remains are found below an active nest, SCE will document the remains and verify the nesting status of the common ravens (e.g., incubating, feeding nestlings) and notify the BLM, Service, and CDFG and/or NDOW verbally (via phone call) and in writing (via email or fax) within 24 hours of documenting the remains. SCE will mark or collect the DT remains after verification with the Service. Upon being notified, the Service will contact the Common Raven Management Working Group which will coordinate immediate removal of the offending common raven(s) in California.

In addition, SCE will establish a Cooperative Service agreement with USDA/APHIS facilitating Wildlife Services' (WS) performance of removal efforts of offending common raven(s) and nests on EITP structures. SCE will be responsible for expenses attributed to removal of common ravens and nests on EITP structures. The Cooperative Agreement would allow the removal of offending ravens and their nests through a depredation permit held by APHIS-WS. Nest removal of offending ravens will occur at the time of raven removal to the greatest extent possible depending upon impacts to personnel safety or system reliability. Also, at least once per year and outside of the avian breeding season and the DT's most active season, where personnel safety or system reliability does not pose a threat, SCE will remove all other raven nests (e.g., inactive or non-offending ravens) identified during the monthly surveys. SCE will dispose of nesting material so that it is no longer available for nest building (e.g., removal to a landfill, or disposal at a SCE facility). APHIS-WS intends to respond to nest removal within 2 - 3 days following notification of nest(s) identified on EITP tower structures belonging to offending raven(s). However, Agency response time may be limited by available personnel or other unavoidable factors out of the scope of this RMP. The joint Cooperative Agreement when prepared between SCE and APHIS-WS will establish working timeframes to manage ravens documented to negatively impact the DT.

The Qualified Biologist(s) or FWS-approved SCE designee will also conduct nest surveys at the Eldorado and Ivanpah substations.

- Surveys will begin in February and will continue through May, occurring between the 15th and last day of each month.
- If an active common raven nest is located, searches for the presence of DT remains within a 15-meter radius of the nest will be conducted.
- If DT remains are found, SCE will follow the same procedure outlined above; provided that personnel safety or system reliability is not of concern. Similarly, common ravens nesting on the substation facilities will be removed in accordance with the aforementioned procedures.

SCE will annually submit progress reports to the USFWS, BLM, CDFG and NDOW within 90 days of the years' last survey effort. The annual report would contain nest survey monitoring and raven removal results including GIS layer(s) of all the nests recorded / destroyed and ravens removed during the year. After 3 years of compiling nest survey and raven removal activities, an effectiveness evaluation of this conservation measure will be performed by SCE inclusive of identification of appropriate adaptive measures for SCE's implementation in the next breeding season. Based on the effectiveness of initial conservation measures, SCE will implement adaptive management measures after timely consultation with the BLM, USFWS, CDFG, and NDOW.

The frequency and type of surveys implemented may increase or decrease depending on survey results and the effectiveness of monitoring and removal efforts. If avian predation concerns become apparent interim to the third-year RMP evaluation, adaptive measures addressing the situation would be identified and implemented with the agencies concurrence. Nest monitoring and common raven removal will be conducted for the life of the project or

until SCE demonstrates, and the agencies agree, that any or all of these actions are no longer necessary based on the results of nest monitoring surveys and raven removals.

An evaluation of the effectiveness of this conservation measure will be reviewed by SCE, BLM, USFWS, CDFG, and NDOW on an annual basis in order to develop appropriate adaptive measures for EITP for the next breeding season. The frequency and type of surveys implemented may increase or decrease depending on survey results and the effectiveness of the monitoring and removal. SCE will implement adaptive management measures after consultation with the Service based on the effectiveness of conservation measures. Nest monitoring and removal, searches for desert tortoise remains, and common raven removal will be conducted for the life of the project or until SCE demonstrates, and the Service agrees, that any or all of these actions are no longer necessary based on the results of the nest monitoring surveys.

Raven Control Contribution: SCE will establish a contract with USDA/APHIS-WS and fund raven depredation activities.

Appendix B. NEVADA BLM SECTION 7 LAND DISTURBANCE FEE PAYMENT FORM

Biological Opinion File Number: 84320-2010-F-0448

Biological Opinion Issued By: Nevada Fish and Wildlife Office, Las Vegas, Nevada

Species: Desert Tortoise (*Gopherus agassizii*) (Mojave population)

Project Name: Eldorado-Ivanpah Transmission Project

Project Proponent: Southern California Edison

Phone Number:

Payment Calculations:	Clark County		_____ County		_____ County	
	Critical habitat	Non-critical habitat	Critical habitat	Non-critical habitat	Critical habitat	Non-critical habitat
# acres anticipated to be disturbed on federal land	93.6	211.2				
Fee rate (per acre)	$3,537.00	$786.00				
Subtotals	$331,063.20	$166,003.20				
Total cost per county	$ 497,066.40		$ -		$ -	

Amount paid: _____ **Date:** _____ **Check/Money Order #:** _____

Authorizing agencies: Bureau of Land Management, Las Vegas Nevada

Make check payable to: Bureau of Land Management

Deliver check to:

Physical Address
Bureau of Land Management
Attn: Information Access Ctr
1340 Financial Blvd.
Reno, NV 89502

PO Box
Bureau of Land Management
Attn: Information Access Ctr
PO Box 12000
Reno, NV 89520-0006

For BLM Public Room

Process check to:
Contributed Funds-All Other
WBS: LVTFF1000800
7122 FLPMA
All other Res. Dev. Project and Management

Remarks: LLNV9300000 L71220000.JP0000 LVTFF1000800 Desert Tortoise Conservation Program

Please provide a copy of this completed payment form and the payment receipt to NV-930, Attn: T&E Program Lead

***T&E Program Lead will provide a copy to the appropriate District Office(s)*

DUDEK

MAY 2013

Eldorado-Ivanpah Transmission Project

FIGURE 1

Vicinity Map

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Figure DC–24: 3Ø Single Circuit 12/16 kV 4-Wire

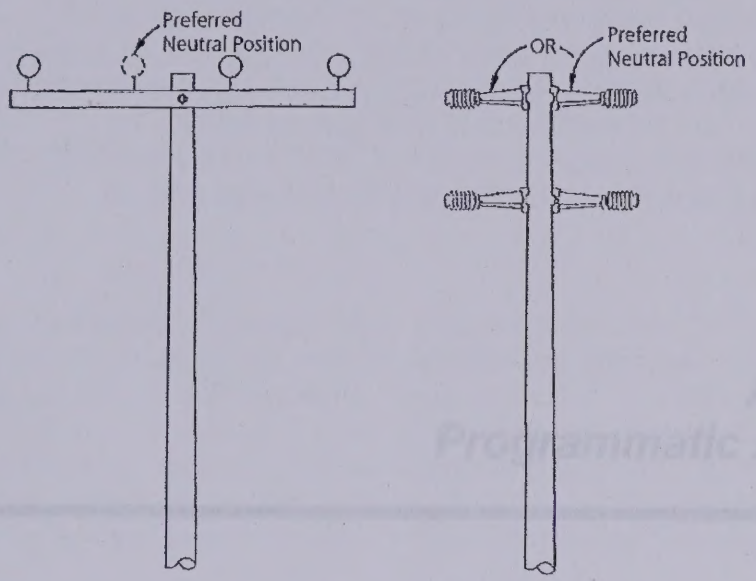
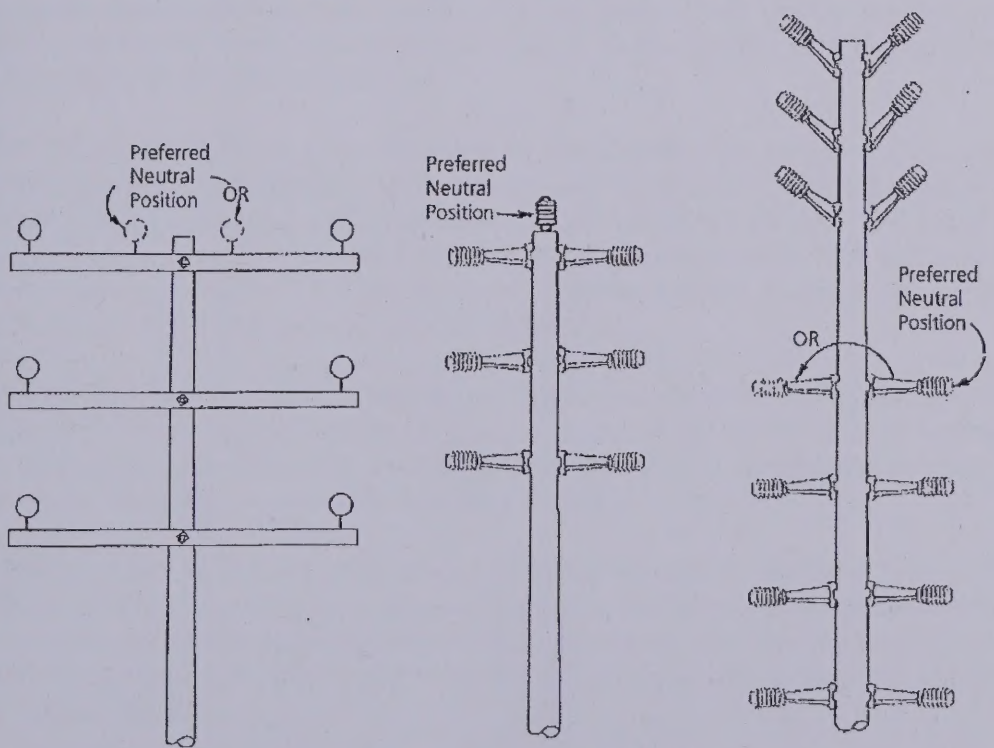


Figure DC–25: 3Ø Double Circuit 12/16 kV 4-Wire



Effective Date 10-29-2004	12/16 kV 4-Wire Straight Line — Typical	Approved
DC510 DOH	Distribution Overhead Construction Standards ▸ SCE Internal ◂	
Page DC-28		

"Copyright© 2004 by Southern California Edison Company"

FIGURE 2

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Appendix 3
Programmatic Agreement

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PROGRAMMATIC AGREEMENT
AMONG
THE BUREAU OF LAND MANAGEMENT,
THE SOUTHERN CALIFORNIA EDISON COMPANY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND THE NEVADA STATE HISTORIC PRESERVATION OFFICER
REGARDING THE MANAGEMENT OF
HISTORIC ELECTRIC POWER CONVEYANCE SYSTEMS
IN THE STATES OF CALIFORNIA AND NEVADA

WHEREAS, the Southern California Edison Company (hereinafter, "SCE") holds and applies for right-of-way (ROW) grants and permits on public lands managed by the Bureau of Land Management in California and Nevada (hereinafter, "the BLM") in accordance with the Federal Land Policy and Management Act (P.L. 940-579, as amended; hereinafter, "FLPMA") for the purpose of constructing, operating, maintaining, modifying, or replacing electrical power distribution and conveyance facilities, some of which are included in or may be eligible for inclusion in the National Register of Historic Places (hereinafter, "historic properties" and "the NRHP"); and

WHEREAS, the BLM considers requests to grant a ROW or issue permits to other applicants for actions which may require the modification, removal, or replacement of electric power conveyance systems and related facilities owned by SCE and other historic properties that may be affected by such Undertakings; and

WHEREAS, the BLM has determined that the modification, removal, or replacement of electric power conveyance systems and related facilities owned by the SCE located on BLM lands or subject to BLM approval is an "Undertaking" as defined in 36 CFR 800.16(y) requiring a ROW grant or Federal permit , which are Federal actions as described at 36 CFR 800.3(a), which may result in similar, redundant, and repeated types of adverse effects on electric power conveyance facilities that are historic properties owned by SCE; and

WHEREAS, this Programmatic Agreement (Agreement) provides a programmatic approach that effectively, efficiently, and consistently takes into account the effects of Undertakings on electric power conveyance facilities that are historic properties and the background and intent of the Agreement are further described in Appendix A; and

WHEREAS, the BLM has consulted with the California and Nevada State Historic Preservation Officers (SHPO), to participate in consultation to resolve the potential adverse effects of an Undertaking on historic properties and the BLM chooses to continue its assessment of an Undertaking's potential adverse effect and resolve any such effect through the implementation of this Agreement; and

WHEREAS, in accordance with regulations at 36 CFR 800.14(b)(3), the BLM has notified and invited the Advisory Council on Historic Preservation (hereinafter, "ACHP") per 36 CFR 800.6(a)(1)(C) to participate in consultation to resolve the potential effects of an Undertaking on Historic Properties, and as per their letter dated December 14, 2009, the ACHP has elected not to participate in this Agreement; and

WHEREAS, SCE has participated in consultation per 36 CFR 800.2(c)(4), is willing to carry out the stipulations of this Agreement under the oversight of the BLM, and is an Invited Signatory to this Agreement; and

WHEREAS, SCE maintains a document and photographic archive at the Huntington Museum, Pasadena, California, which provides documentation and curation of SCE records and demonstrates SCE's commitment to preservation of historic records about historic projects and infrastructure; and

WHEREAS, the stipulations of this Agreement shall be appended to and made a part of any BLM Environmental Impact Statement/Record of Decision authorizing any Undertaking including but not limited to other Programmatic or Memorandum of Agreements that intends to use this Agreement to resolve adverse effects to historic properties that are the subject of this Agreement; and

NOW, THEREFORE, the BLM and the California and Nevada State Historic Preservation Officers (hereinafter, "Signatories) and the SCE, as an Invited Signatory, agree that Undertakings shall be implemented in accordance with the following stipulations in order to take into account the effects on historic properties.

STIPULATIONS

BLM agrees to ensure the following stipulations are carried out:

I. DEFINITIONS

The definitions found at 36 CFR 800.16 apply throughout this Agreement except where another definition is offered as follows:

"Related undertaking" or **"related project"** is an Undertaking requiring the grant of a ROW or issuance of a permit by the BLM to an applicant other than SCE that may require the modification or replacement of components of electric power conveyance systems which may be historic properties owned or managed by SCE.

"Consulting parties" means collectively the Signatories and Invited Signatories to this Agreement, without implying any change regarding the authorities of any of those parties to amend or terminate this Agreement.

"Cultural resources" refers to an object or location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, buildings, places, or objects and definite locations of traditional cultural use by specified social and/or culture groups. Cultural resources include the entire spectrum of resources, from artifacts to cultural landscapes, without regard to eligibility for inclusion in the NRHP.

"Electric power conveyance facilities" refers to transmission power lines that typically carry at least 115 kV of electricity, sub-transmission lines that convey between 66 and 115 kV, distribution lines that carry less than 66 kV, and substations/switching stations that serve all three levels of power transmission. Electric power conveyance facilities include the wood poles and lattice steel towers, H-frame structures (of wood or steel construction) and any other types of poles or towers that support the electrical lines above the ground, and substations, buildings, other types of structures or objects that contribute to the physical transmission, or delivery of electrical power.

"Invited Signatories" include consulting parties (e.g., SCE) who have responsiblities within the consultation process described in this Agreement. Invited Signatories have the same rights with regard to seeking amendments or termination of this Agreement as the other Signatories.

"Right-of-Way" or **"Right-of-Way Corridor"** (ROW) is as defined in FLPMA (Section 501 [43 U.S.C. 1761], "Grant, Issue or Renewal of Rights-of-Ways" and 503 [43 U.S.C. 1763], "Right-of-Way Corridors", respectively), and means an area of land designated by a federal land management agency for use by by a grantee for the construction, operation and maintenance of a project.

"Signatories" refers to the BLM and the SHPOs. Signatories have responsiblities within the consultation process described in this Agreement. Signatories have the sole authority to execute, amend or terminate this Agreement.

II. SCOPE OF THIS AGREEMENT

a) Unless otherwise agreed to by the consulting parties through the process described in Stipulation XII, this Agreement will apply only to:

   i) elements of SCE electric power conveyance facilities located on lands managed by the BLM, unless the Federal action extends to non-Federal lands where an Undertaking lacks independent utility.

   ii) the identification and treatment of adverse effects to certain types of electric power conveyance facilities associated with SCE electric power systems included in, or eligible for inclusion in the NRHP, including lattice steel towers, H-frame structures (of wood or steel construction), wood poles, and associated substation/switching stations that are contributing elements to historic properties. This Agreement does

not include buildings, structures or objects not associated with electric power conveyance systems, or archaeological sites unless they are components of or the remains of components of an electric power conveyance facility; and

b) The treatment measures prescribed in this Agreement shall supersede any other prior Programmatic Agreement or Memorandum of Agreement that might otherwise be applicable to the treatment of adverse effects to the historic properties subject to this Agreement.

c) The terms of this Agreement may be used to resolve the specific adverse effects described in this Agreement for a Undertaking proposed by SCE, or in consultation with SCE, another Applicant whose Undertaking may have an adverse effect on an SCE electric power conveyance facility.

i) This Agreement may stand alone to resolve the effects for an Undertaking where adverse effects to a component of an SCE electric power conveyance facility are the only effects to be resolved.

ii) This Agreement may be referenced or included as an appendix to another Agreement to resolve the effects for an Undertaking where adverse effects to a component of an SCE electric power conveyance facility is not the only effect to be resolved.

III. AREA OF POTENTIAL EFFECTS

a) The Area of Potential Effect (APE) is defined as the total geographic area or areas within which the undertaking may directly or indirectly cause alterations in the character or use of historic properties per 36 CFR 800.16(d).

i) The APE is limited to those elements of SCE's electric power conveyance facilities which contain historic properties subject to this Agreement that could sustain direct and indirect physical effects as a result of the undertaking.

(1) Direct effects may result from the modification, removal, or replacement of electric power conveyance facilities.

(a) Where modification, removal or replacement of multiple electric power conveyance facilities may occur, the APE shall be defined in a manner to consider effects to a historic landscape embodied by the facilities.

(2) Indirect effects may result from alterations in the character or use of an electric power conveyance facility or a historic landscape of which an electric power conveyance facility is a component.

(a) Where introduction of visual, auditory, or atmospheric elements diminish the integrity of a property's significant historic features.
(b) Where removal of an electric power conveyance facility diminish the integrity of values that define a historic landscape.

ii) The APE may be amended by written agreement of the Signatories, in consultation with SCE.

IV. ROLES AND RESPONSIBILITIES

a) The BLM shall be responsible for ensuring compliance with Section 106 of the NHPA, providing oversight of this Agreement, coordinating the roles of other consulting parties, participating in the resolution of objections among the consulting parties, and providing technical assistance and guidance as needed to the other consulting parties to this Agreement.

i) The BLM California Desert District Office (CDDO) will assume primary management and responsibility for implementing the terms of this Agreement, and will coordinate with the BLM Field Offices on implementation of this Agreement on lands under their management responsibility.

ii) SCE projects or other projects that may utilize the provisions of this Agreement within a single State may be managed by the appropriate BLM Field Office.

iii) The BLM CDDO will coordinate with all offices utilizing this Agreement for Undertakings that occur in both California and Nevada.

iv) Any District or Field Office within the California Desert District or Southern Nevada District of BLM may be the lead Federal agency for an Undertaking which may utilize the terms of this Agreement.

b) The BLM shall be responsible for reviewing and approving all actions covered by this Agreement carried out by SCE or other Applicants to comply with Section 106 of the NHPA, including:

i) identification of cultural resources within the APE of each Undertaking;

ii) evaluations of NRHP eligibility of cultural resources and consultation with SHPOs regarding NRHP eligibility;

iii) determinations of effects on historic properties;

iv) implementation of treatment measures to resolve any adverse effects on historic properties per this Agreement; and

v) other historic preservation measures for which an Applicant may be made responsible under this Agreement.

c) Unless otherwise agreed to by the consulting parties, the following procedures and timing will apply to activities carried out per the terms of this Agreement.

i) Minor modifications as outlined in Appendix C to properties listed in Appendix B shall be managed by standard recordation treatment and documented in an annual report of activities authorized under this Agreement and submitted to the SHPOs by BLM.

ii) Upon the submission of any documents or at the request of the SCE, BLM will have 20 days to review and comment. SCE will have 10 days to respond to BLM comments. Upon review and acceptance of any document or report required by this Agreement, BLM will submit the document or report to the SHPO(s) who will have 30 days to comment.

iii) The BLM will have 20 days to review and comment on any SCE recommendations. If the BLM disagrees with any SCE recommendation, BLM may direct SCE to reconsider or the BLM and SCE may consult with the appropriate SHPO(s) to resolve the disagreement.

iv) The SHPO(s) will have 30 days from receipt of adequate documentation to respond to the BLM's determinations of eligibility.

V. STANDARDS AND QUALIFICATIONS

a) **PROFESSIONAL QUALIFICATIONS.** All actions prescribed by this Agreement shall be carried out by or under the direct supervision of a person or persons meeting, at a minimum, the *Secretary of the Interior's Professional Qualifications Standards* (PQS) for archaeology, history, or architectural history, as appropriate (48 FR. 44739). Those actions include the identification, evaluation, analysis, recordation, treatment, monitoring, and disposition of historic properties and that involve the reporting and documentation of such actions in reports, forms or other records. However, nothing in this stipulation may be interpreted to preclude any party qualified under the terms of this paragraph from using the services of properly supervised persons who do not meet the PQS.

b) **DOCUMENTATION STANDARDS.** Reporting and documenting the actions cited in Paragraph IV(a) of this stipulation shall conform to every reasonable extent with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR. 44716-44740). The BLM will ensure that recordation and documentation of appropriate cultural resources is consistent with California Department of Parks & Recreation (hereinafter, DPR) form 523, Nevada Cultural Resource

Information System (hereinafter, NVCRIS) form HRIF, National Park Service (hereinafter, "NPS") Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey (hereinafter, "HABS/HAER/HALS") Guidelines (e.g., Federal Register vol. 68, no. 139, pp. 43159-43162 http://edocket.access.gpo.gov/2003/03-8197.htm]; *and* http://www.nps.gov/history/hdp/standards/index.htm); and ACHP archaeological guidance at http://www.achp.gov/archguide/, the BLM 8100 Manual, and the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, as applicable.

VI. EVALUATION OF ELECTRIC POWER CONVEYANCE FACILITIES

a) The BLM will consult with both SHPOs, as appropriate, regarding the NRHP eligibility of any SCE electric power conveyance facility that extends across the line demarcating the states of California and Nevada and that includes structures that may be adversely affected by an Undertaking subject to this Agreement.

   i) For any historic property located entirely within one State, the BLM will consult with the SHPO for that State.

   ii) Pursuant to the process provided at Stipulation IV(c), the SHPOs may comment on the NRHP eligibility of unevaluated properties or properties previously evaluated.

   iii) The BLM will coordinate with the SHPOs to manage historic properties in a consistent manner in both states. Prior determinations of eligibility in either State made in consultation with the appropriate SHPO shall remain in force unless the BLM and the appropriate SHPO consult and agree to amend the prior determinations.

b) SCE will assess whether the electric power conveyance facilities within the APE and subject to this Agreement retain historical integrity, taking into account that such facilities have historically undergone modification as part of periodic and routine maintenance. Past periodic and routine maintenance shall be considered a historic activity. Such modifications shall not be considered to have affected the historic integrity of the properties if:

   i) electric power conveyance structures are original construction or substantially retain their original fabric, look, and feel; and

   ii) all post-period-of-significance modifications were in-kind and retain original design integrity, for example original porcelain insulators have been replaced with porcelain insulators (i.e., the presence of porcelain insulators is sufficient for integrity to be maintained); and modifications such as retro-installed concrete tower footings have been installed to ensure original tower stability and meet safety requirements.

c) The BLM, in consultation with SCE, may treat a SCE electric power conveyance facility as eligible for the NRHP for project management purposes and proceed to assess the effects of an Undertaking on those historic properties consistent with Stipulation VIII of this Agreement.

VII. TREATMENT OF HISTORIC PROPERTIES / STANDARD TREATMENT MEASURES

a) SCE will develop historic contexts for portions of its electric power conveyance systems subject to this Agreement as provided for in Stipulation VII(b). Such contexts shall establish the historical significance of any property with the APE and identify its period of significance. SCE may develop a comprehensive historic context for its generation and distribution systems that may be applied to any historic properties subject to this Agreement provided that the historic context presents a level of detail so that all types of structures within the APE are described and their historical significance evaluated.

b) SCE will develop a typology of structures for properties within the APE sufficient to distinguish among structure types and assist in structure evaluation by taking into account design, engineering, function, materials and methods of construction and any other variables that differentiate the function of structures in a distribution system.

i) Within six months of the date of execution of this Agreement, SCE will submit the following to the Signatories.

(1) The following shall be included in Appendix B to this Agreement.

(a) An initial list of historic transmission lines, segments, or known historic properties that SCE recommends be subject to the terms of this Agreement and a justification for their inclusion.
(i) SCE may modify or add to the list of historic facilities subject to the terms of this Agreement at any time by notifying the Signatories, providing a description of the facility and justification for its inclusion.
(b) An initial list of structure typologies and historic contexts.
(c) An initial list of historic properties that will be affected by current projects and a summary of actions taken or to be taken to resolve adverse effects per the terms of this Agreement.

(2) The following shall be included in Appendix C to this Agreement.

(a) An initial list of minor actions affecting NRHP eligible SCE electric conveyance system features that will be subject, without further consultation, to standard treatment measures, and reported to the consulting parties annually.

c) SCE may submit structure typologies, historic contexts, and resource evaluations for any specific Undertaking separately or concurrently.

VIII. MANAGEMENT OF EFFECTS ON HISTORIC PROPERTIES

a) The BLM will apply the criteria of adverse effect found at 36 CFR 800.5(a)(1) to historic properties within the APE to assess whether any electric power conveyance facility that is a contributing element of any proposed historic property may sustain adverse effects of any Undertaking subject to this Agreement.

   i) If the BLM finds an adverse effect, the BLM will proceed to resolve the adverse effect consistent with the terms of this Agreement.

   ii) Removal of wood distribution system poles from any historic property will be considered not adverse if poles are replaced with wood poles of similar size on a one-for-one basis with no alignment change.

b) In the event that an Undertaking subject to this Agreement causes adverse effects on a historic property, the resolution of adverse effects on the historic property shall be as follows.

   i) For each type of structure identified in the typology per Stipulation VII(b) and approved by BLM and the SHPOs per Stipulation IV(c), SCE will, in California, prepare a DPR Form 523 and Building/Structure/Object supplement for review by the BLM. Upon BLM approval, the form will be submitted to the appropriate California Historical Resources Information System (CHRIS) Information Center as directed by BLM. For each type of structure in Nevada, SCE will prepare a Historic Resources Inventory Form (HRIF), provide the form for review to the BLM, and upon approval by the BLM submit the form to the Nevada SHPO.

   ii) Consistent with Stipulation VI(b), SCE will recommend the level of HABS/HAER/HALS documentation that is appropriate to record any historic structure types or landscapes that may sustain adverse effects and submit to BLM a proposal to implement the recordation.

      (1) Unless otherwise agreed to or required by the Signatories, the HABS/HAER/HALS documentation for an Undertaking may be classed as "informal," meaning that although prepared to National Archive standards, the final documents are submitted only to the California State Library, SHPO, the California Historical Resources Information System, the Huntington Museum, the Nevada State Museum in Las Vegas, or other facilities as agreed upon by the consulting parties.

(2) Upon completion of the HABS/HAER/HALS recording and assembling of records, drawings, etc. for archiving, SCE will submit the HABS/HAER/HALS recording and an executed agreement between SCE and a library, archives or other repository stipulating that SCE will donate the appropriate items.

(3) For effects to an individual structure type, one example of each type of structure that contributes to the NRHP eligibility shall be documented according to HABS/HAER standards. One example shall be sufficient treatment for all such structures associated with a given Undertaking subject to this Agreement.

(4) HABS/HAER recordation will be required only once for each state for any given type of structure as defined in the historic context for the affected historic property, regardless where it is on a given SCE project or if it also occurs on other SCE projects. If SCE proposes to remove or modify a type of structure already documented, SCE will notify the BLM in writing, provide a written and photographic description of the structure(s) to be affected, and reference the previous HABS/HAER recordation. SCE will also present a graphic representation of the affected distribution line indicating what if any other structures have been previously treated, indicating the position on the line of the structures to be modified or removed. If the structures have been recorded on separate SCE projects, SCE will provide a graphic of the project showing the number and location of structures previously treated. In case records and files for individual SCE projects are archived separately, SCE will also indicate to the BLM if there are any additional records, drawings or other materials that pertain to the affected structures that should be added to the archives and submit proof that such materials have been archived.

(5) Where modification, removal or replacement of multiple electric power conveyance facilities may occur and such facilities constitute a historic landscape, HALS documentation of the historic landscape shall be the appropriate treatment.

c) For each Undertaking resulting in a modification of a historic property subject to this Agreement and affecting a structure type already addressed per Stipulation VIII(b), SCE will provide to the BLM, a brief report documenting original compliance with Stipulation VIII(b). Minor modifications as outlined in Appendix C to properties listed in Appendix B shall be subject to standard treatment and reported annually to the consulting parties.

IX. RESOLVING OBJECTIONS

a) Should a Signatory or Invited Signatory object at any time, to the manner in which the terms of this Agreement are implemented, the BLM will immediately notify the consulting parties and request their comments on the objection within 30 days, and then proceed to consult with the Signatory or Invited Signatory for no more than 30 days to resolve the objection.

b) If the objection can be resolved within the consultation period, the BLM may authorize the disputed action to proceed in accordance with the terms of such resolution.

c) If at the end of the 30 day consultation period, the BLM determines that the objection cannot be resolved through such consultation, the BLM will forward all documentation relevant to the objection to the ACHP per 36 CFR 800.2(b)(2). Any comments provided by the ACHP within 30 days after its receipt of all relevant documentation will be taken into account by the BLM in reaching a final decision regarding the objection. The BLM will notify the consulting parties and the ACHP in writing of its final decision within 14 days after it is rendered. The BLM shall have the authority to make the final decision resolving the objection. The BLM's responsibility to carry out all other actions under this Agreement that are not the subject of the objection will remain unchanged.

d) At any time during implementation of the terms of this Agreement, should an objection pertaining to the Agreement be raised by a member of the public, the BLM shall immediately notify the SHPOs about the objection and take the objection into account. The other Signatories and Invited Signatories may comment on the objection to the BLM. The BLM shall consult with the objecting party(ies) for no more than 30 days. Within 14 days following closure of consultation, the BLM will render a decision regarding the objection and notify all parties of its decision in writing. In reaching its final decision, the BLM will take into account all comments from the parties regarding the objection. The BLM shall have the authority to make the final decision resolving the objection.

e) Any dispute pertaining to the NRHP eligibility of historic properties or cultural resources covered by this Agreement will be addressed by the BLM per 36 CFR 800.4(c)(2). A determination of eligibility by the Keeper of the National Register will be the final determination in the matter and will be accepted by all consulting parties to this Agreement.

X. REPORTING AND ACCOUNTABILITY

a) The BLM CDDO will coordinate all reporting required by this Agreement.

b) By December 1 of each year following the execution of this Agreement until it expires or is terminated, the BLM CDDO shall provide the consulting parties to this Agreement a summary report detailing work undertaken pursuant to its terms. Such report shall include a summary of actions taken pursuant to this Agreement, any scheduling changes proposed, any problems encountered, and any disputes and objections received in the BLM's efforts to carry out the terms of this Agreement.

   i) On or after October 1 of each year, the SCE shall provide the BLM CDDO a summary of actions taken pursuant to this Agreement, including an account of the SCE projects that utilized the provisions of this Agreement, an account of the adverse

effects to historic properties resolved under the terms of this Agreement, and a summary of the actions taken to resolve effects pursuant to this Agreement.

c) Reporting pursuant to this Agreement may be incorporated in the annual reporting requirements for the BLM California Protocol Agreement. BLM Nevada may separately submit the annual report for this Agreement to the Nevada SHPO as part of its reporting requirements for the BLM Nevada Protocol Agreement.

XI. DURATION OF THIS AGREEMENT

a) This Agreement will expire if the stipulations of this Agreement have not been initiated within five (5) years from the date of its execution. Prior to the expiration date of this Agreement, the BLM may consult with the other consulting parties to extend the Agreement or reconsider the terms of the Agreement and amend it in accordance with Stipulation XII. The BLM shall notify the Signatories as to the course of action the agency will pursue within 30 days of the expiration of the Agreement.

b) This Agreement expires 25 years from its effective date unless extended by written agreement of the Signatories. The Signatories and Invited Signatories shall consult at year 10 to review this Agreement. Additionally, the Signatories and Invited Signatories shall consult not less than one year prior to the expiration date to reconsider the terms of this Agreement and, if acceptable, have the Signatories extend the term of this Agreement. Reconsideration may include continuation of the Agreement as originally executed or amended, or termination. Extensions are treated as amendments to the Agreement under Stipulation XII.

c) Unless the Agreement is terminated pursuant to Stipulation XIII or another agreement executed for the a specific undertaking supersedes it, this Agreement will remain in full force and effect until BLM, in consultation with the other Signatories and Invited Signatories, determines that implementation of all aspects of the undertaking has been completed and that all terms of this Agreement and any subsequent tiering requirements have been fulfilled in a satisfactory manner. At such time, BLM will notify the consulting parties of this Agreement in writing of the agency's determination. This Agreement will terminate and have no further force or effect on the day that BLM so notifies the Signatories to this Agreement.

XII. AMENDMENT

a) Any Signatory or Invited Signatory to this Agreement may at any time propose amendments, whereupon all Signatories shall consult to consider such amendments pursuant to 36 CFR 800.6(c)(7) and 800.6(c)(8). This Agreement may be amended only upon written agreement of the signatories.

b) Amendments to this Agreement shall take effect on the date of full execution by the Signatories.

c) Modifications, additions, or deletions to the appendices made as a result of continuing consultation among the consulting parties shall not require the Agreement to be amended.

XIII. TERMINATION

a) Only Signatories and Invited Signatories may terminate this Agreement. If this Agreement is not amended as provided for in Stipulation XII, or if a Signatory or Invited Signatory proposes termination of this Agreement for other reasons, the party proposing termination shall notify the other consulting parties in writing, explain the reasons for proposing termination, and consult for no more than 30 days to seek alternatives to termination.

b) Should such consultation result in an agreement on an alternative to termination, the Signatories and Invited Signatories shall proceed in accordance with that agreement.

c) Should such consultation fail, the Signatory or Invited Signatory proposing termination may terminate this Agreement by promptly notifying the other parties in writing.

d) Should this Agreement be terminated, the BLM shall either consult in accordance with 36 CFR 800.14(b) to develop a new Agreement or request the comments of the ACHP pursuant to 36 CFR 800.4–800.6.

e) Beginning with the date of termination, the BLM shall ensure that until and unless a new Agreement is executed for the undertakings covered by this Agreement, such undertakings shall be reviewed individually in accordance with 36 CFR 800.4-800.6.

f) This Agreement will terminate and have no further force or effect when BLM, in consultation with the other Signatories and Invited Signatories, determines that all terms of this Agreement have been fulfilled in a satisfactory manner on the day that BLM so notifies the other Signatories and Invited Signatories to the Agreement.

Execution and implementation of this Agreement is evidence that BLM has afforded the ACHP a reasonable opportunity to comment on the undertaking and its effects on historic properties. The Signatories to this Agreement represent that they have the authority to sign for and bind the entities on behalf of whom they sign.

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SIGNATORY PARTIES

U.S. BUREAU OF LAND MANAGEMENT (California)

BY: _____ DATE: 9/27/10

James Wesley Abbott
State Director

U.S. BUREAU OF LAND MANAGEMENT (Nevada)

BY: _____ DATE: 9/27/10

Ron Wenker
State Director

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

BY: _____ DATE: 27 SEP 2010

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

NEVADA STATE HISTORIC PRESERVATION OFFICER

BY: _____ DATE: 9/27/10

for Ronald James
State Historic Preservation Officer

INVITED SIGNATORY

SOUTHERN CALIFORNIA EDISON COMPANY

BY: _____ DATE: _____

Paul Multari
Director, Project Management Organization

APPENDIX A: BACKGROUND AND INTENT

SCE provides reliable electric service to more than 13 million people in 180 cities in 50,000 square miles of service area in central, coastal and southern California. Electric power conveyance facilities are constantly subject to maintenance, modification, reconfiguration and replacement in order to continue to serve as viable system components.

Several of SCE's electric power conveyance facilities are situated on and cross Bureau of Land Management (BLM) land in California and Nevada. The BLM must grant ROWs or permits to build and operate facilities on BLM land in accordance with the Federal Land Policy and Management Act (P.L. 940-579). The BLM must also comply with Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) (NHPA) prior to issuing ROWs or permits to build or modify these electric power facilities.

Many of the facilities throughout SCE's electric power systems were constructed in the early- to mid-20th century, and some of these are listed or eligible for the National Register of Historic Places (NRHP), while many other such resources have not been evaluated. Electric power conveyance facilities that are contributing elements to historic properties may be modified repeatedly as the result of adding new generation capacity into the electrical grid or for other reasons to meet federal and state efficiency and reliability standards.

The maintenance, modification or replacement of NRHP listed and eligible electric power conveyance facilities may adversely affect historic properties. Numerous proposed and future energy projects, system reconfigurations, and maintenance activities involve BLM lands with effects to historic properties that are similar and repetitive in nature. Accordingly, the BLM and State Historic Preservation Officers for California and Nevada (SHPOs) have determined that implementation of this Programmatic Agreement (hereinafter, "Agreement") prepared pursuant to 36 CFR 800.14(b)(1)(i) and (iii), will fulfill the requirements of NHPA Section 106 for multiple undertakings by effectively, efficiently, and consistently considering the effects of those undertakings on electric power conveyance facilities that are historic properties.

Highlights of this Agreement

The treatment of adverse effects under this Agreement is limited to electric power conveyance facilities (transmission, sub-transmission, and distribution line structures, and substation/switching stations) associated with SCE electric power systems listed in, or eligible for listing in the NRHP, including lattice steel towers, H-frame structures (of wood or steel construction), wood poles, switch racks, circuit breakers, transformers, and other ancillary features that are contributing elements to historic properties. This Agreement does not include buildings, other types of structures, objects or archaeological sites that are historic properties unless they are directly associated with the Historic Property/Historic District electric power conveyance system. If historic properties not related to the electric power conveyance system are present and would be adversely affected by an Undertaking, a separate agreement or treatment plan would be necessary.

This Agreement describes a programmatic approach that:

(1) stipulates roles and responsibilities of participating agencies and others;

(2) facilitates identification of historic properties;

(3) determines adverse effects,

(4) establishes treatment and mitigation measures; and

(5) streamlines the resolution of adverse effects.

SCE has specific responsibilities for managing historic properties according to this Agreement, including:

(1) certain routine historic properties management activities (per 36 CFR 800.14(b)(1)(iv));

(2) development of a typology for electrical towers that will facilitate their evaluation and allow SCE to determine the types and number of towers of various types that may be affected by undertakings;

(3) development of historic contexts for electrical power systems that provides the background for evaluation;

(4) implementing standard treatment measures stipulated in this Agreement including various levels of resource recordation such as California DPR forms and HABS/HAER recording of only one of each type of structure, or HALS recording where a group of structures may constitute a historic landscape, to take into account routine and repetitive adverse effects of undertakings on historic properties (per 36 CFR 800.14(b)(1)(v)); and

(5) producing an annual report of activities undertaken under the terms of this Agreement including certain routine activities listed in Appendix C for which SHPO notification is the only regulatory requirement.

The stipulations of this Agreement may be appended to and made a part of the BLM's Record of Decision authorizing any SCE project or non-SCE project that would utilize the terms of this Agreement, after consultation with SCE.

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Appendix 4
Mitigation, Monitoring and Compliance Program

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Appendix 4 Mitigation, Monitoring and Compliance Plans

This appendix includes:

1. A list of the standard terms, conditions, and stipulations that will be made contained in the approved right-of-way (ROW) grant for the Eldorado-Ivanpah Transmission Project (EITP).
2. A list of all agency Mitigation Measures (MMs) and Applicant Proposed Mitigation (APM) carried forward from the Final EIR/EIS that are adopted by the Bureau of Land Management (BLM) and made part of the Record of Decision and ROW grant. **These measures have previously been incorporated into the California Public Utilities Commission (CPUC) Decision**.
3. A DRAFT Mitigation Monitoring Compliance Reporting Program for the EITP project. This plan will be finalized and incorporated into the applicant's final Plan of Development.

Standard Terms, Conditions and Stipulations

1. The holder shall submit a final plan of development that describes in detail the construction, operation, maintenance, and termination of the ROW and its associated improvements and/or facilities. The plans will be reviewed, and if appropriate, modified and approved by the Authorized Officer. Once approved by the Authorized Officer, the plan of development shall be made a part of the ROW grant. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this ROW in strict conformity with the approved Plan of Development, as amended or supplemented by approval of the Authorized Officer. Any surface disturbing activity, additional construction, or use that is not in accord with the approved Plan of Development shall not be initiated without the prior written approval of the Authorized Officer. A copy of the complete ROW lease/grant, including all stipulations and approved Plan of Development, shall be made available on the ROW area during construction, operation, and decommissioning. Noncompliance with the above will be grounds for immediate temporary suspension of activities if it constitutes a threat to public health or safety or the environment.
2. The holder shall not initiate any construction or other surface disturbing activities on the ROW without the prior written authorization of the Authorized Officer. Such authorization shall be a written **Notice to Proceed** issued by the Authorized Officer. Any Notice to Proceed shall authorize construction or use only as therein expressly stated and only for the particular location or use therein described.
3. The holder will arrange and schedule a preconstruction conference(s) with the BLM Authorized Officer prior to the holder's commencing construction and/or surface disturbing activities on the ROW or specific construction phase of the ROW. The holder and/or his representatives will attend this conference. The holder's contractor, or agents involved with construction and/or any surface disturbing activities associated with the ROW, will also attend this conference to review the stipulations of the authorization, including the Plan of Development, as applicable. The holder shall notify the Authorized Officer of the schedule for any preconstruction conference at least 14 calendar days in advance of the preconstruction conference.
4. The holder shall designate a representative(s) who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the Authorized Officer within a reasonable time when construction or other surface disturbing activities are underway.
5. A bond, acceptable to the Authorized Officer, shall be furnished by the holder prior to issuance of a Notice to Proceed with construction or at such earlier date as may be specified by the Authorized Officer. The amount of this bond shall be determined by the Authorized Officer based upon the holder's final Plan of Development and Reclamation, Restoration, and Revegetation Plan. This bond must be maintained in effect until removal of improvements and restoration of the ROW have been accepted by the Authorized Officer.

The holder agrees that all monies deposited with the Authorized Officer as security for holder's performance of the terms and conditions of this grant may, upon failure on the holder's part to fulfill any of the requirements herein set forth or made a part hereof, be retained by the United States to be applied as far as may be needed to the satisfaction of the holder's obligations assumed hereunder, without prejudice whatever to any other rights and remedies of the United States.

Should the bond delivered under this grant become unsatisfactory to the Authorized Officer, the holder, shall, within 30 days of demand, furnish a new bond.

6. The holder shall comply with the CPUC Certificate of Public Convenience and Necessity, and any changes made thereto, issued by the CPUC on December 16, 2010. Noncompliance with the requirements of the Certificate of Public Convenience and Necessity will be grounds for immediate temporary suspension of activities and operations within the ROW by the Authorized Officer.

7. The holder shall be bound by the Reasonable and Prudent Measures and Terms and Conditions contained in the Biological Opinion for listed and proposed species associated with this project signed by the U.S. Fish and Wildlife Service (USFWS, or the Service) on April 29, 2011. Failure to comply with the requirements of the Biological Opinion shall be cause for suspension or termination of the ROW grant.

8. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or federal land shall be immediately reported to the Authorized Officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder. The holder shall also comply with the Programmatic Agreement titled, "Programmatic Agreement for Historic Steel Lattice Towers," signed and executed by all parties and effective on September 28, 2010.

9. The holder shall comply with the construction practices and mitigating measures established by 33 CFR 323.4, which sets forth the parameters of the "nationwide permit" required by Section 404 of the Clean Water Act. If the proposed action exceeds the parameters of the nationwide permit, the holder shall obtain an individual permit from the appropriate office of the Army Corps of Engineers and provide the Authorized Officer with a copy of same. Failure to comply with this requirement shall be cause for suspension or termination of the ROW grant.

10. Unless otherwise agreed to in writing by the Authorized Officer, powerlines shall be constructed in accordance with standards outlined in "Suggested Practices for Raptor Protection on Powerlines"(APLIC 2006). The holder shall assume the burden and expense of proving that pole designs not shown in the above publication are "eagle safe." Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modifications or additions to all powerline structures placed on this ROW, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

11. The holder shall protect all survey markers found within the ROW. Survey markers include, but are not limited to, Public Land Survey System line and corner markers, other property boundary line and corner markers, and horizontal and vertical geodetic monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the Authorized Officer and the respective installing authority if known. Where any of the above survey markers are obliterated or disturbed during operations, the Authorized Officer will determine how the marker is to be restored. The holder will be instructed to secure the services of a registered land surveyor or informed that an official survey will be executed by the BLM. All surveying activities will be in conformance with the Manual of Surveying Instructions and appropriate State laws and regulations. Surveys by registered land surveyors will be examined by the Authorized Officer and the BLM State Office Chief Cadastral Surveyor for conformance with the Manual of Surveying Instructions and State laws and regulations before being filed in the

appropriate State or county offices of record. The holder shall be responsible for all administrative and survey costs.

12. Use of pesticides and herbicides shall comply with all applicable federal and State laws. Pesticides and herbicides shall be used only in accordance with their registered uses within limitations imposed by the Secretary of the Interior. Prior to the use of the pesticides, the holder shall obtain from the Authorized Officer, written approval of a Pesticide Use Proposal Plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, locations of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer.

13. Only those chemicals (pesticides and herbicides) listed on the BLM approved label list are authorized for use on public lands. A Pesticide Use Proposal must be submitted for each chemical used, and it cannot be used until approval has been obtained in writing from the Authorized Officer. The proposal needs to identify any surfactants or dyes used in the spraying operation. Applicator(s) of chemicals used must have completed pesticide certification training and have a current up to date Certified Pesticide Applicator's License. Pesticide and herbicide application records for the areas and acres treated must be submitted to the Authorized Officer each year. This includes the following:

    - Brand or Product name,
    - EPA registration number,
    - Total amount applied (use rate #A.I./acre),
    - Date of application,
    - Location of application,
    - Size of area treated,
    - Method of treatment (air/ground),
    - Name of applicator,
    - Certification number and dates,
    - Costs to treatment, and
    - Amount of surfactants or dyes used in spraying operation.

    The record information must be recorded no later than 14 calendar days following the pesticide or herbicide application and must be maintained for ten years.

14. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. 'Waste' means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. A litter policing program shall be implemented by the holder which covers all roads and sites associated with the ROW.

15. The holder shall comply with all applicable federal, State and local laws and regulations, existing or hereafter enacted or promulgated, with regard to any Hazardous Materials, as defined in this paragraph, that will be used, produced, transported or stored on or within the ROW, or used in the construction, operation, maintenance or decommission of the ROW or any of its facilities. 'Hazardous material' means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any 'hazardous waste' as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 U.S.C. 6901 et seq. and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended. 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in CERCLA, 42

U.S.C. 9601, et seq. or RCRA, 42 U.S.C. 6901 et seq.) on the ROW (unless the release or threatened release is wholly unrelated to the ROW holder's activity on the ROW). This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

16. Within 90 calendar days of completion of construction, the holder will submit to the Authorized Officer as-built drawings and a certification of construction verifying that the facility has been constructed in accordance with the design, plans, specifications, and applicable laws and regulations.

17. The holder will be liable for all fire suppression costs resulting from fires caused during construction or operations. The holder shall comply with all guidelines and restrictions imposed by agency fire control officials.

18. The holder shall fund in accordance with 43 CFR 2805.16 a third party Compliance and Inspection Program as deemed necessary by the Authorized Officer to ensure compliance with the terms, conditions, and stipulations of this ROW lease/grant and applicable laws and regulations.

19. The holder shall not initiate any construction or other surface disturbing activities as a minor change to the ROW or Plan of Development without prior written approval of the Authorized Officer, or his/her delegate. Such authorization shall be a written Change of Condition or Variance. Each Change of Condition/Variance shall authorize construction or use only as therein expressly stated and only for the particular location and use therein described. All Changes of Condition/Variances are subject to such terms and conditions as deemed necessary by the Authorized Officer at the time of approval. Approved changes authorize construction or use only as therein expressly stated and only for the particular location, phase, area, or use described. The Authorized Officer may by written notice suspend or terminate in whole or in part any change of condition/variance which has been approved, when in the Authorized Officer's judgment, unforeseen conditions arise which result in the approved terms and conditions being inadequate to protect the public health and safety or to protect the environment.

20. The USFWS has notified the BLM that due to the proximity of known occupied Golden Eagle territories, and that the potential effects of power lines on Bald and Golden Eagles is unknown, this project has the potential to take an eagle. Due to the distance of the project site to known eagle territories, available mitigation measures, and habitat compensation associated with other species (i.e. desert tortoise), USFWS believes that this project can reach the "no net loss" standard for Golden Eagles identified in the Eagle Act Rule if the applicant submits and implements an Avian Protection Plan. The holder shall submit an Avian Protection Plan for review and approval of the USFWS and Authorized Officer prior to initiating construction.

21. The holder must ensure full compliance with the following Reasonable and Prudent Measures (RPMs) with implementing Terms and Conditions as described in the Biological Opinion for the project. Full compliance by the holder with these Terms and Conditions is required and is non-discretionary.

    RPM 1: *The BLM, or other jurisdictional federal agencies as appropriate, shall ensure that desert tortoises in harm's way are located, properly handled, and moved to safety; other measures will be in place to avoid and protect tortoises within the action area but not in harm's way.*

    Terms and Conditions:

    a. A desert tortoise education program shall be presented to all personnel onsite during construction activities. This program will contain information concerning the biology and distribution of the desert tortoise, its legal status and occurrence in the proposed project area, the definition of take and associated penalties, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when desert tortoises are encountered.

    b. Authorized desert tortoise biologists and a designated Field Construction Representative (FCR) shall be onsite during all construction activities to ensure compliance with this biological opinion, including avoidance of inadvertently harming any desert tortoises that may wander onto the construction site.

The FCR and authorized desert tortoise biologist will have direct access to BLM and Service staff. The authorized desert tortoise biologist and FCR shall be responsible for: (1) enforcing the litter-control program; (2) ensuring that desert tortoise habitat disturbance is restricted to authorized areas; (3) ensuring that all equipment and materials are stored within the boundaries of the construction zone or within the boundaries of previously-disturbed areas or designated areas; (4) ensuring that all vehicles associated with construction activities remain within the proposed construction zones; and (5) ensuring compliance with the Terms and Conditions of this biological opinion.

The authorized desert tortoise biologist shall also capture, handle, and relocate tortoises from harm's way in accordance with the Desert Tortoise Field Manual (Service 2009). Potential authorized biologists must submit their statement of qualifications (Appendix C) to the Service's Nevada Fish and Wildlife Office and the California Department of Fish and Game (CDFG) for approval, allowing a minimum of 30 days for Service response. The form is available on the internet at: http://www.fws.gov/nevada/desert_tortoise/auth_dt_form.htm.

c. Prior to surface-disturbing activities, an authorized desert tortoise biologist potentially assisted by project monitors, shall conduct a clearance survey to locate and remove desert tortoises using techniques providing full coverage of all areas. Two passes of complete coverage will be accomplished. All desert tortoise burrows, and other species burrows that may be used by desert tortoises, will be examined to determine occupancy of each burrow by desert tortoises. Any desert tortoises or eggs found in the fence line will be relocated offsite by an authorized desert tortoise biologist in accordance with approved protocol (Service 2009). Desert tortoise burrows that occur immediately outside work areas that can be avoided by project activities shall be clearly marked or flagged to prevent crushing.

d. All burrows found within areas proposed for disturbance, whether occupied or vacant, shall be excavated by an authorized desert tortoise biologist and collapsed or blocked to prevent desert tortoise re-entry. All burrows will be excavated with hand tools to allow removal of desert tortoises or desert tortoise eggs. All desert tortoise handling and excavations, including nests, will be conducted by an authorized desert tortoise biologist in accordance with Service-approved protocol (Service 2009).

e. All located desert tortoises in harm's way shall be relocated to safe areas up to 1,000 feet from the point of capture. Desert tortoises found aboveground will be placed under a bush in the shade. A desert tortoise located in a burrow will be placed in an existing unoccupied burrow of the same size and orientation as the one from which it was taken. If a suitable natural burrow is unavailable or the occupancy status of the burrow is in question, a qualified desert tortoise biologist will construct one of the same size and orientation as the one from which it was removed using the protocol for burrow construction (Service 2009).

   Desert tortoises shall be handled according to Service-approved protocol (Service 2009) which includes instruction for tortoise encounters during high temperatures. If a tortoise is injured as a direct or indirect result of project activities, it shall be immediately transported to a veterinarian or wildlife rehabilitation facility such as the Desert Tortoise Conservation Center in Las Vegas. In California, the veterinarian or facility must be approved by CDFG.

f. Any desert tortoise found within one hour before nightfall shall be placed in a separate, clean cardboard box and held in a cool, predator-free location. The box will be covered and kept upright at all times to minimize stress to the tortoise. Each box will be used once and then disposed properly. The desert tortoise will be released the next day in the same area from which it was collected and using the procedures described above. Each desert tortoise will be handled with new disposable latex gloves. After use, the gloves will be properly discarded and a fresh set used for each subsequent desert tortoise handling.

g. Project activities that may endanger a desert tortoise shall cease if a desert tortoise is found on the project site. Project activities will resume after an authorized desert tortoise biologist removes the desert tortoise from danger or after the desert tortoise has moved to a safe area.

h. If a tortoise is found, the authorized desert tortoise biologist, monitor, or FCR shall inform workers in the area to be particularly watchful for the tortoise as it may return to the work area.

i. Final tower and spur road locations will be adjusted to avoid potentially active tortoise burrows to the greatest extent feasible.

j. Areas underneath parked project vehicles and equipment will be inspected for desert tortoises before moving them.

k. Steep-walled trenches or excavations will be monitored, covered, or fenced to exclude all tortoises during construction to prevent entrapment of tortoises.

l. Vehicle speed within the project area will not exceed 20 miles per hour. Speed limits will be clearly marked and all workers will be made aware of these limits.

m. Water used for fugitive dust control will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

n. Should any desert tortoise be injured or killed, all activities will be halted, and the FCR and/or authorized desert tortoise biologist immediately contacted, who will notify the appropriate office of the Service.

RPM 2: *The BLM, or other jurisdictional federal agencies as appropriate, shall ensure implementation of measures to minimize predation on desert tortoises by ravens or other desert tortoise predators attracted to the project area.*

Terms and Conditions:

a. A litter control program shall be implemented to reduce the attractiveness of the area to opportunistic predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed properly in predator-proof containers with re-sealing lids. Trash containers will be emptied and construction waste will be removed daily from the project area and disposed of in an approved landfill.

b. Dogs will be prohibited in all project work areas.

c. The BLM shall ensure that the Raven Management Plan is implemented (Appendix B).

RPM 3: *The BLM, or other jurisdictional federal agencies as appropriate, shall ensure implementation of measures to minimize loss and long-term degradation of desert tortoise habitat, such as soil compaction, erosion, crushed vegetation, or introduction of non-native invasive plants or weeds as a result of project activities.*

Terms and Conditions:

a. Perennial native vegetation will be flagged and avoided to the extent feasible.

b. Cross-country travel and travel outside designated access roads and project construction areas shall be prohibited.

c. Prior to surface-disturbing activities associated with the proposed project, the BLM shall ensure that all compensation commitments for habitat disturbance, in the Description of the Proposed Action of this biological opinion are fulfilled by the applicant. For disturbance in Nevada, the applicant shall submit fee payment with the fee payment form (Appendix A).

d. The BLM and applicant shall coordinate to salvage and relocate cacti, yuccas, and shrubs for onsite and offsite restoration efforts.

e. All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain

within the ROW, existing roads, and designated areas. Staging areas will be located in previously-disturbed areas whenever possible.

f. The applicant will develop a Reclaimation, Restoration, and Revegetation Plan (RRRP) that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. Post-construction monitoring will be performed for one to five years, depending on the disturbance level and restoration level as outlined in the BLM's 2001 Restoration Plan for Energy Projects, version 2 (BLM 2004). Post-construction monitoring will be performed annually unless the BLM determines less frequent monitoring is appropriate.

g. An Invasive Plant Management Plan will be developed and implemented. The plan will be modeled on the BLM's Las Vegas Office DRAFT Weed Plan (BLM 2006).

RPM 4: *The BLM, or other jurisdictional federal agencies as appropriate, shall ensure implementation of measures to ensure compliance with the Reasonable and Prudent Measures, Terms and Conditions, reporting requirements, and reinitiation requirements contained in this biological opinion.*

Terms and Conditions:

a. The authorized desert tortoise biologist shall record each observation of desert tortoise handled. Information will include the following: location (GPS), date and time of observation, whether desert tortoise was handled, general health and whether it voided its bladder, location desert tortoise was moved from and location moved to, and unique physical characteristics of each tortoise. Reports documenting effectiveness and compliance with the desert tortoise protection measures will be prepared and submitted to appropriate agencies every six months.

b. The reporting requirements would include the submission of an assessment after construction is completed. The report would outline the schedule that was followed for implementing the minimization measures as well as biological observations (as stated above) and the general success of each of the minimization measures and the maintenance activities that occurred over that period.

c. A final report will be submitted to the Service's Las Vegas and Ventura offices within 90 days of completion of construction of the project. An annual report regarding the effects of the operation and maintenance of EITP on desert tortoise and the results of the raven monitoring program will be submitted to these offices by January 31 of each year.

d. Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with this biological opinion will be documented immediately by the authorized desert tortoise biologist. The FCR will document the incident in the report in Term and Condition 4.a. along with the appropriate corrective action taken.

22. The holder shall compensate the BLM for disturbance to Desert Tortoise habitat in accordance with the following guidelines for California and Nevada:

California Lands:

BLM compensation requirements for new disturbance in desert tortoise habitat is specified in the California Desert Conservation Area Plan, as amended as 1:1 land replacement outside of designated critical habitat and 5:1 within designated critical habitat. The proposed project is expected to result in 49.7 acres of disturbance to habitat not designated as desert tortoise critical habitat and 2.01 acres disturbance to designated desert tortoise critical habitat (DTCH). Therefore, compensation lands will equal 49.7 acres of non-DTCH (1:1) and 10.05 acres of DTCH (5:1).

The lands will be purchased either by the applicant or the applicant can deposit funds with the National Fish and Wildlife Foundation (NFWF) under the Renewable Energy Action Team (REAT) account governed by the REAT/NFWF memorandum of agreement (MOA). If funds are deposited with the NFWF, a

compensation fee will be assessed based on current fair market appraised value for the specific geographic area in which the acquisition occurs. The acquired lands will occur in desert tortoise habitat with equivalent function and value. The replacement habitat is intended to benefit the population of desert tortoise adversely affected by the project. The BLM, the Service, and the CDFG will coordinate to reach mutual agreement on the selection and ownership/management of acquired lands.

If funds are provided to NFWF, the (1) compensation funds will be provided prior to project construction, (2) lands will be acquired prior to completion of project construction, and (3) lands will be conserved in perpetuity by a legal mechanism agreed to by the three agencies. If the conservation lands are acquired directly by the applicant, steps 2 and 3 will apply.

Regardless of the acquisition method (by applicant or NFWF), the applicant will establish a management fund for the agency that owns and manages the acquired lands. The management fund will consist of an interest-bearing account (as described in the REAT/NFWF MOA), with the amount of capital commensurate to generate sufficient interest to fund all monitoring, management, and protection of the acquired lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and other actions designed to protect or improve the habitat values of the acquired lands. A Property Analysis Record, as described at: http://cnlm.org/cms/index.php?option=com_content&task=view&id=21&Itemid=155, or comparable method, will be conducted by Southern California Edison (SCE) and reviewed by the BLM, the Service, and the CDFG, to determine the management needs and costs described above, which then will be used to calculate the amount of capital needed for the management fund. This management fund will be held and managed by NFWF or another entity approved by the BLM, the Service, and the CDFG.

Nevada Lands:

The EITP would disturb 220 acres of non-DTCH and 93.6 acres of DTCH in Nevada which included 8.8 acres of the Boulder City Conservation Easement (BCCE). The applicant will pay compensation for disturbance of habitat prior to surface-disturbing activities associated with the proposed project. Disturbance of DTCH will be compensated at the current rate of $3,537 per acre (factor of 4.5 x base rate of $786). The multiplier used in this rate calculation was derived from Hastey et al. (1991), and consists of a multiplier of 3.0 for habitat quality (i.e., critical habitat), plus 0.5 for growth-inducing effects of the project, plus 1.0 for long-term effects of the action (>10 years), resulting in a total factor of 4.5. The disturbance of non-DTCH will be compensated at $786 per acre of disturbance.

Fees for the 8.8 acres of disturbance of BCCE land shall be donated to the Clark County Desert Conservation Program (DCP) to be applied towards costs associated with desert tortoise habitat enhancement within the BCCE, because this area is protected by the County for the benefit of desert tortoise and their habitat. The federal agency or project proponent shall contact the Desert Conservation Program at the address below for specific instruction on submitting payment. The total fee for BCCE disturbance outside the BLM corridor is $6,916.80.

Clark County Desert Conservation Program
333 North Rancho, Suite 625
Las Vegas, Nevada 89106

Total remuneration fees to be paid to the BLM for the project based on the current base rate of $786 per acres, are $497,066.40 ($503,983.20- $6,916.80 for BCCE disturbance). These funds will be used for management actions expected to provide a benefit to the desert tortoise over time. Actions may involve habitat acquisition, population or habitat enhancement, increasing knowledge of the species biological requirements, reducing loss of individual animals, documenting the species' current status and trends, and preserving distinct population attributes. Specific actions to be funded will be determined during annual meetings between the BLM and the Service to identify and prioritize management actions, which may

include implementation of rangewide tortoise monitoring, and management of the Desert Tortoise Conservation Center (BLM and Service 2010).

The fee rate will be indexed for inflation based on the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U) on January 31st of each year. The next adjustment shall occur on January 31, 2012, and will become effective March 1, 2012. Fees assessed or collected for projects covered under this biological opinion after March 1st of each year will be adjusted based on the CPI-U. Information on the CPI-U can be found on the Internet at: http://stats.bls.gov/news.release/cpi.nws.htm.

These funds are independent of any other fees collected by the BLM for desert tortoise conservation planning. The payment to BLM shall be accompanied by the attached Section 7 Land Disturbance Fee Payment Form (Appendix A), and completed by the payee.

MITIGATION MEASURES AND APPLICANT PROPOSED MITIGATION that have been adopted in this Decision as taken from the FEIS:

3.2 Visual Resources

Mitigation Measures

MM AES-1: Painting the Ivanpah Substation. Prior to construction, the applicant will consult with the BLM to select an appropriate color from the BLM approved palette to paint any enclosed structures that would be constructed for the Ivanpah Substation. The applicant will submit photographs following substation construction to the BLM and the CPUC to document compliance with this measure.

MM AES-2: Rock Staining near the Ivanpah Substation. For areas that are cleared and/or graded to construct the Ivanpah Substation, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.

MM AES-3: Microwave Dish Color. Prior to construction, the color of the microwave dishes or covers must be approved by the BLM. White dishes or covers will be avoided to minimize color contrast with the existing landscape.

Applicant Proposed Measures

APM AES-1: Road Cut Rock Staining. Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.

APM AES-2: Seeding and Inter-Planting. Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, road cuts would be treated by seeding and/or inter-planting into the disturbed areas to restore the area to an appearance that would blend back into the overall landscape context.

APM AES-3: Non-Reflective Finish. Lightweight steel towers and tubular steel poles would be constructed of steel that was galvanized and treated at the factory to create a dulled finish that would reduce reflection of light off of the tower members. As appropriate to the environment, the galvanized coating would also be treated to allow the towers to blend into the backdrops. Non-specular transmission cable would be installed for the new transmission line to minimize conductor reflectivity.

APM AES-4: Regrade/Revegetate Construction Sites. Areas around new or rebuilt transmission and subtransmission structures that must be cleared during the construction process would be regraded and revegetated to restore them to an appearance that would blend back into the overall landscape context.

APM AES-5: Use Existing Access Roads. To the extent feasible, existing access roads would be used.

APM AES-6: Minimize Road Modifications. Widening and grading of roads would be kept to the minimum required for access by proposed project construction equipment.

APM AES-7: Dust Suppression. During the construction period, dust suppression measures would be used to minimize the creation of dust clouds potentially associated with the use of the access roads.

APM AES-8: Substation Lighting Control. The substation lighting would be designed to be manually operated only when required for non-routine nighttime work. The lighting would be directed downward and shielded to eliminate offsite light spill at times when the lighting might be in use.

3.3. Air Quality

Mitigation Measures

MM AIR-1: Low-emission Construction Equipment. All construction equipment with a rating between 100 and 750 horsepower (hp) will be required to use engines compliant with U.S. EPA Tier 2 non-road engine standards. In addition, all off-road and portable construction diesel engines not registered under the CARB Statewide Portable Equipment Registration Program that have a rating of 50 hp or more will meet, at a minimum, the Tier 2 California non-road engine standards unless that engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine will be equipped with a Tier 1 engine. The applicant will substitute small electric-powered equipment for diesel- and gasoline-powered construction equipment where feasible. The applicant will maintain construction equipment according to manufacturing specifications and use low-emission equipment.

MM AIR-2: Enhanced Dust Control Measures. In addition to the dust control requirements by Mojave Desert Air Quality Management District (MDAQMD) and Clark County Department of Air Quality and Environmental Management (CC-DAQEM), the following measures will be implemented for mitigation:

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area;
- Pre-watering of soils prior to clearing and trenching;
- Pre-moistening of, prior to transport, import and export dirt, sand, or loose materials;
- Dedication of water truck or high-capacity hose to any soil screening operations;
- Minimization of drop height of material through screening equipment;
- Reduction of the amount of disturbed area where possible; and
- Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the project's Reclamation Plan as described in MM BIO-2.

MM AIR-3: Best Management Practices for Greenhouse Gas (GHG) Reduction. The applicant would be required to enforce and follow limits for idling time for commercial vehicles, including delivery and construction vehicles. The applicant would be also be required to consider the following best management practices (BMPs) to reduce the potential for GHG emissions:

- Joining U.S. EPA's SF6 Emission Reduction Partnership for Electric Power Systems (http://www.epa.gov/highgwp/electricpower-sf6/basic.html);
- Performing annual inspections and estimation of SF6 emissions using an emission inventory protocol;
- For equipment that would contain SF6, purchasing only new equipment that meets International Council on Large Electric Systems (CIGRE) standards for leak rates;
- Implementing SF6 recovery and recycling;
- Ensuring that only knowledgeable personnel handle SF6; and
- Providing a vanpool for construction workers.

3.4 Biological Resources

Mitigation Measures

MM BIO-1: Preconstruction Surveys. Preconstruction surveys will be conducted by USFWS-approved biologists according to the most current USFWS protocols, where available by species. These surveys will include surveying brush clearing areas and ground disturbance areas within habitat deemed suitable for sensitive species by a qualified biologist. As part of the pre-construction surveys, the composition of the vegetation community will be surveyed to establish baseline conditions prior to construction for post-construction restoration efforts. These surveys will be conducted for the presence of special-status plants, the presence of noxious weeds, and the presence of general and special-status wildlife species, to prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species. For the noxious weeds survey, the level of effort and extent of the surveys will be outlined by the Invasive Plant Management Plan (MM BIO-4).

MM BIO-2: Reclamation Plan. The applicant will develop a Reclamation, Restoration, and Revegetation Plan (RRRP) prior to adoption of the Final EIR/EIS that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. The RRRP will be part of the applicant's final Plan of Development for the project and should address all federal and private land disturbances, including areas where restoration activities have been funded by the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and initiated by resource agencies. The RRRP will be developed in consultation with appropriate agencies (BLM, CPUC, CDFG, and Clark County DCP) and be provided to these agencies for review and approval prior to preparation of the Final EIR/EIS. The Nevada Department of Wildlife (NDOW) and the BLM Las Vegas Field Office will be consulted for restoration efforts concerning Nevada State protected cacti and yucca species, which may include preparation of a separate Cactus and Yucca Reclamation Plan. The RRRP will also provide details including but not limited to topsoil segregation and conservation, vegetation treatment and removal, salvage of succulent species, revegetation methods including seed mixes, rates and transplants, and criteria to monitor and evaluate revegetation success. Post-construction monitoring will be performed for 1 to 5 years, depending on the disturbance level and restoration level as outlined in the BLM's 2001 Restoration Plan for Energy Projects in the Las Vegas Field Office.

MM BIO-3: Special-Status Plants Restoration and Compensation. The applicant will mitigate for the loss of special-status plant species within the project area following the completion of all construction activities at a particular site and within 1 year of post-construction according to the requirements of resource agency authorizations (e.g., CDFG 2081 permit). Special-status plants will be restored by relocation of plants and/or re-seeding, replacing topsoil with existing topsoil that was removed, and re-grading to pre-existing soil contours. Measures to restore special-status plants will be implemented through the Reclamation Plan (MM BIO-2). Additionally, that plan will provide a matrix showing how the applicant will address each species considered sensitive or special-status in terms of mitigation type (e.g., seed collection, transplanting, fencing certain population, and compensation measures). The CDFG will likely require land compensation and enhancement and endowment fees for the project in addition to restoration. If special-status plant communities cannot be restored, the applicant will provide compensation if required, in consultation with appropriate agencies (USFWS, BLM, CDFG, NDOW, and CPUC). In order to ensure enforceability, documentation of consultations with all appropriate agencies will be provided to the CPUC (the California Environmental Quality Act [CEQA] lead agency).

MM BIO-4: Model Invasive Plant Management Plan on the BLM Las Vegas Office DRAFT Weed Plan. The Invasive Plant Management Plan to be developed (APM BIO-10) will be modeled on the BLM Las Vegas Office DRAFT Weed Plan. The plan will include operation and maintenance activities, as well as construction activities. The content of the plan will include results of the noxious weed inventory, identification of problem areas, preventative measures, treatment methods, agency-specific requirements, monitoring requirements, and herbicide treatment protocol. The plan will include BMPs that require that any biological material brought onsite (e.g., hay bales that may be used for controlling stormwater under APM GEO-2, and native mixes for vegetation in MM BIO-2) will be certified weed-free. The plan will be submitted to both the California and the Nevada resource agencies and to the CPUC for approval prior to construction authorization.

MM BIO-5: Jurisdictional Delineation. Conduct a formal jurisdictional delineation within the boundaries of the project area once final engineering for the location of project-specific features is complete. This will be conducted prior to construction and is required in order to apply for permits, if needed, with the United States Army Corps of Engineers (USACE), California Regional Water Quality control Boards (RWQCBs), and CDFG. A copy of the jurisdictional delineation will be provided to the CPUC.

MM BIO-6: Drainage Crossings Design. If drainages cannot be avoided by infrastructure placement, then the applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.

MM BIO-7: Mitigation Monitoring Plan for Affected Jurisdictional Areas. The applicant will develop a Mitigation Monitoring Plan for affected jurisdictional areas within established riparian areas, as needed, for submittal to the USACE for review and approval. The plan will outline measures to accomplish restoration, provide criteria for restoration success, and/or provide compensation ratios. This measure is needed to compensate for loss of waters and riparian vegetation that provide suitable habitat for special-status and sensitive species, and provide important hydrological and water quality functions in the desert environment. Monitoring and reporting, likely for up to 3 to 5 years post-construction, will be required, pending consultation with agencies. A copy of the approved Mitigation Monitoring Plan will be provided to the CPUC and CDFG.

MM BIO-8: Reduce Night Lighting. Night lighting will be reduced in all natural areas to avoid unnecessary visual disturbance to wildlife. Night lighting during construction, operations, and maintenance will be reduced in natural areas using directed lighting, shielding methods, and/or reduced lumen intensity. The applicant will indicate anticipated measures to resource agencies for approval prior to construction. The approved measures will be provided to the CPUC.

MM BIO-9: Cover Steep-walled Trenches or Excavations during Construction. To prevent entrapment of wildlife, all steep-walled trenches, auger holes, or other excavations will be covered at the end of each day. Fencing will be maintained around the covered excavations at night. For open trenches, earthen escape ramps will be maintained at intervals of no greater than 0.25 miles. A biological monitor will inspect all trenches, auger holes, or other excavations a minimum of twice per day during non-summer months and a minimum of three times per day during the summer (hotter) months, and also immediately prior to back-filling. Any wildlife species found will be safely removed and relocated out of harm's way, using suitable tools such as a pool net when applicable. For safety reasons, biological monitors will under no circumstance enter open excavations.

MM BIO-10: Biological Monitors. Biological monitors will be provided throughout construction activities in all construction zones with the potential for presence of sensitive biological resources. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use.

MM BIO-11: Water Usage. Water used for fugitive dust control will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

MM BIO-12: Desert Tortoise Impacts Reduction Measures. To reduce impacts on desert tortoise, the following will be done:

- The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC and the Clark County DCP.
- Construction monitoring will employ a designated field contact representative (FCR), authorized biologist(s), and qualified biologist(s) approved by the USFWS, NDOW, and CDFG during the construction phase of the project. BLM will recommend qualified, authorized biologists to the USFWS and will approve all biological monitors.

- Qualified and/or authorized biologists will monitor all construction activities year-round in desert tortoise habitat, regardless of the time of year or weather conditions, as tortoises are often active outside their "active" season.
- Qualified and/or authorized biologists will conduct preconstruction surveys according to the most current USFWS protocol.
- Authorized biologists will handle desert tortoises following the most current Desert Tortoise Council handling guidelines (2009 or newer).
- Prior to commencing desert tortoise relocation activities, authorization will be obtained from NDOW, CDFG, and USFWS. The authorized biologist will not be required to receive approval to move individual desert tortoises during construction.
- Desert tortoise relocations will only occur from an active construction zone to an area that is not under active construction by the EITP project or any other planned project.
- Biological monitors will clear ahead of construction crews in desert tortoise habitat during all clearing and grading activities, or during any activity where undisturbed vegetation would be crushed. In addition, biological monitors will clear ahead of larger, non-rubber-tired equipment when that equipment is being driven on access and spur roads.
- Biological monitors will clear all active work sites located in desert tortoise habitat each morning before construction begins and throughout the day if crews move from construction site to construction site.
- Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within two working days of when desert tortoises are harmed.
- No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95 degrees Fahrenheit (35 degrees Celsius). No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95 degrees Fahrenheit before handling or processing can be completed. If the ambient air temperature exceeds 95 degrees Fahrenheit during handling or processing, desert tortoises shall be kept shaded in an environment which does not exceed 95 degrees Fahrenheit, and the animals shall not be released until ambient air temperature declines to below 95 degrees Fahrenheit. For relocation, captured tortoises may be held overnight and moved the following morning within these temperature constraints.
- During all handling procedures, desert tortoises must be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (e.g., gaping, foaming at the mouth, hyperactivity, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises must be kept shaded at all times until it is safe to release them. Ambient air temperature must be measured in the shade, protected from wind, and at a height of 2 inches above the ground surface.
- If a desert tortoise voids its bladder as a result of being handled, the animal shall be rehydrated. The process of rehydrating a desert tortoise will take place at the location where the animal was captured (or to be released, for translocated tortoises), and consist of placing the desert tortoise in a tub with a clean plastic disposable liner. The amount of water that is placed in the lined tub shall not be higher than the lower jaw of the animal. Each desert tortoise shall be rehydrated for a minimum of 10 to 20 minutes. During the period when the desert tortoise is in the tub, the tub will be placed in a quiet protected area. Desert tortoises shall be soaked individually.
- If a desert tortoise is injured as a result of project-related activities, it shall be immediately taken to a CDFG-approved wildlife rehabilitation or veterinary facility. The applicant shall identify the facility prior to the start of

ground- or vegetation-disturbing activities. The applicant shall bear any costs associated with the care or treatment of such injured covered species. The applicant shall notify CDFG of the injury immediately unless the incident occurs outside of normal business hours. In that event CDFG shall be notified no later than noon on the next business day. Notification to CDFG shall be via telephone or email, followed by a written incident report. Notification shall include the date, time, location, and circumstances of the incident, and the name of the facility where the animal was taken.

- The applicant will produce a Raven Management Plan that is acceptable to the BLM and the CPUC. Details in the plan will include information on procedures, frequency, and recommended season for conducting Raven nest surveys, procedures and responsibilities for Raven nest removal, USFWS/NDOW/CDFG authorization and/or permitting requirements for conducting Raven control, and compensation measures for Raven reduction programs in California and Nevada. The plan will be submitted to the BLM and the CPUC at least 60 days prior to construction for review and approval.

MM BIO-13: Desert Bighorn Sheep Impacts Reduction Measures. To reduce impacts on desert bighorn sheep, the following will be done:

- Conduct preconstruction survey for desert bighorn sheep within suitable bighorn sheep habitat within one week prior to construction activities in the McCullough Range, Clark Mountain Range, and the southern portion of the Eldorado Valley between the Highland Range and the Southern McCullough Range. The occurrence and location of any desert bighorn sheep will be reported to NDOW for sightings in Nevada and reported to CDFG for sightings in California.
- Conduct biological monitoring by a qualified biologist for desert bighorn sheep during duration of construction within suitable bighorn sheep habitat. The occurrence and location of any desert bighorn sheep will be reported to NDOW for sightings in Nevada and reported to CDFG for sightings in California. If bighorn are found to be within 500 feet of construction activities, construction in that area will be stopped until the sheep vacate the project area.
- Avoid all construction activities (with the exception of vehicle use of access roads during emergencies) in lambing areas from January to May in the North McCullough Pass area (approximately MP 9 to MP 12) during the duration of construction and all maintenance events.

MM BIO-14: American Badger Impacts Reduction Measures. To reduce impacts to American badger, the following will be done:

- Qualified biologists will be notified if badgers are observed within the project area during construction activities. Work will immediately be stopped in the area if the biologists find occupied burrows within 100 feet of construction activities during preconstruction surveys.
- Qualified biologists will ensure passive relocation of the occupied burrow by installing one-way trap doors on the burrow. The burrow will be collapsed after the badger vacates.
- During the spring months when young may be present in burrows, burrows must be checked for young before the installation of the one-way trap door. If young are present during relocation efforts, all work will stop within 100 feet of the burrow until the young have left the burrows within the project area.
- Work will be allowed to resume once the badger has relocated outside the 100-foot zone.

MM BIO-15: Migratory Birds and Raptors Impacts Reduction Measures. To reduce impacts on migratory birds and raptors, the following will be done:

- Biological monitors will monitor and enforce disturbance buffers around all active bird nests (for raptors and species protected by the Migratory Bird Treaty Act found in project areas during construction. The general bird breeding season for this area is late February to early July. For raptors specifically, the applicant will use the USFWS Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (1999) to determine appropriate survey areas and disturbance buffers for active nests, except for Burrowing Owl nests, for

which the applicant will be in compliance with the minimum distances outlined by the California Burrowing Owl Consortium Protocol. For all non-raptor bird species, biologists will survey within project areas. Because there are no standardized disturbance buffers for active non-raptor bird nests, SCE will consult with the appropriate agencies (BLM, USFWS, CDFG, and NDOW) on a case-by-case basis when active nests are found in project areas, unless directed to do otherwise by these same agencies.

- Active bird nests will not be moved during breeding season, unless the project is expressly permitted to do so by the USFWS, BLM, CDFG, or NDOW depending on the location of the nest.
- All active nests and disturbance or harm to active nests will be reported within 24 hours to the USFWS, BLM, CDFG, and NDOW upon detection.
- The biological monitor will halt work if it is determined that active nests would be disturbed by construction activities, until further direction or approval to work is obtained from the appropriate agencies.
- Seasonal work stoppages may be required by NDOW for project areas that pass the Wee Thump Joshua Tree Wilderness if construction activities occur within the breeding season. The applicant will consult with NDOW prior to construction.
- As outlined by the Suggested Practices for Avian Protection on Power Lines (APLIC 2006), the following avian safe practices will be employed during construction: cover phase conductors with manufactured covers, include perch discouragers on crossarms and on top of poles, exceed the minimal distance between phase conductors to prevent electrocution by perched birds and their wingspan, utilize longer horizontal insulators, suspend phase conductors on pole top and cross arms, install horizontal jumper support to increase the phase-to-ground separation, replace tension members with fiberglass or non-conducting materials, cover tension members with dielectric material, utilize fiberglass poles or switches, and install standard nest discouragers.

MM BIO-16: Burrowing Owl Impacts Reduction Measures. To reduce impacts on Burrowing Owl, the following will be done:

- A qualified biologist will conduct preconstruction surveys within 30 days prior to construction for Burrowing Owl within suitable habitat prior to breeding season (February 1 through August 31). All areas within 50 meters (approximately 150 feet) of the project area will be surveyed.
- If an active nest is identified, there will be no construction activities within 50 meters (approximately 150 feet) of the nest location to prevent disturbance until the chicks have fledged, as determined by a qualified biologist.
- The occurrence and location of any Burrowing Owl will be documented by biological monitors in daily reports and submitted to the authorized biologist on a daily basis. The authorized biologist will report all incidents of disturbance or harm to Burrowing Owls within 24 hours to the appropriate resource agencies (USFWS, BLM, NDOW, CDFG).

If Burrowing Owls are found onsite in the California portion of the project, the following additional measures will be included:

1) As compensation for the direct loss of Burrowing Owl nesting and foraging habitat, the project proponent shall mitigate by acquiring and permanently protecting known Burrowing Owl nesting and foraging habitat at the following ratio:
   (a) Replacement of occupied habitat with suitable habitat at 1.5 x 6.5 acres per pair or single bird;
   (b) Replacement of occupied habitat with habitat contiguous with occupied habitat at 2 x 6.5 acres per pair or single bird; and/or
   (c) Replacement of occupied habitat with suitable unoccupied habitat at 3 x 6.5 acres per pair or single bird.
2) A Burrowing Owl Mitigation and Monitoring Plan shall be submitted to CDFG for review and approval prior to relocation of owls. The Burrowing Owl Mitigation and Monitoring Plan shall describe proposed relocation and

monitoring plans. The plan shall include the number and location of occupied burrow sites and details on adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation of artificial burrows (numbers, location, and type of burrows) shall also be included in the plan. The plan shall also describe proposed offsite areas to preserve to compensate for impacts to burrowing owls/occupied burrows at the project site as required under Condition 1. A copy of the approved plan will be provided to the CPUC.

MM BIO-17: Gila Monster Compliance. The most current NDOW construction site protocols for the Gila monster (NDOW 2007) will be followed by the applicant in both Nevada and California portions of the project. To reduce impacts on Gila monster, all locations of Gila monster found within the project area during surveys and construction work will be reported to NDOW and the CDFG.

MM BIO-18: Avian Protection Plan. To reduce impacts on golden eagles and raptors, the applicant shall submit an Avian Protection Plan for approval to the BLM within six months of the issuance of any ROW grant for the project. The Plan shall be prepared according to guidance provided by the USFWS (USFWS 2010). The Avian Protection Plan must be implemented within one year from the date of any ROW grant Notice to Proceed.

Applicant Proposed Measures

APM BIO-1: Conduct Preconstruction Surveys. Preconstruction biological clearance surveys would be conducted by qualified biologists to identify special-status plants and wildlife.

APM BIO-2: Minimize Vegetation Impacts. Every effort would be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation would be flagged for avoidance.

APM BIO-3: Avoid Impacts on State and Federal Jurisdiction Wetlands. Construction crews would avoid impacting the streambeds and banks of streams along the route to the extent possible. As applicable, the necessary permits would be obtained from the appropriate agencies. Impacts would be mitigated based on the terms of the permits. No streams with flowing waters capable of supporting special-status species would be expected to be impacted by the proposed project.

APM BIO-4: Best Management Practices. Crews would be directed to use Best Management Practices (BMPs) where applicable. These measures would be identified prior to construction and incorporated into the construction operations.

APM BIO-5: Biological Monitors. Biological monitors would be assigned to the project in areas of sensitive biological resources. The monitors would be responsible for ensuring that impacts on special-status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities would need to be restricted in order to protect native plants and wildlife or special-status species. Those restricted areas would be monitored to ensure their protection during construction.

APM BIO-6: Worker Environmental Awareness Program (see CR-2b, PALEO-3, W-11). A Worker Environmental Awareness Program (WEAP) would be prepared. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would include a review of the special-status species and other sensitive resources that could exist in the project area, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel would be maintained.

APM BIO-7: Avoid Impacts on Active Bird Nests. SCE would conduct project-wide raptor and nesting bird surveys and remove trees or other vegetation, if necessary, outside of the nesting season (nesting season in the project area is late February to early July). If vegetation or existing structures containing a raptor nest or other active nest needed to be removed during the nesting season, or if work was scheduled to take place in close proximity to an active nest on an existing transmission or subtransmission tower or pole, SCE would coordinate with the USFWS, CDFG, and/or the NDOW as appropriate to obtain written verification prior to moving the nest.

APM BIO-8: Avian Protection. All transmission and subtransmission towers and poles would be designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (APLIC 2006).

APM BIO-9: Facility Siting. Final tower and spur road locations would be adjusted to avoid sensitive biological resources to the greatest extent feasible.

APM BIO-10: Invasive Plant Management. An invasive plant management plan would be developed to reduce the potential for spreading invasive plant species during construction activities.

APM BIO-11: Desert Tortoise Measures. The applicant or a qualified consultant would provide for the following to reduce impacts on desert tortoise:

- The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. Additionally, compliance discussions with Clark County and Boulder City must occur prior to construction that resolve and outline the specific compensation fees or additional mitigation measures needed for loss of desert tortoise habitat. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC.
- A FCR would be designated and would oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The FCR would also oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion.
- All work area boundaries associated with temporary and permanent disturbances would be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers would strictly limit activities and vehicles to the designated work areas.
- Crushing/removal of perennial vegetation in work areas would be avoided to the maximum extent practicable.
- All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens.
- Pets would not be allowed in working areas unless restrained in a kennel.
- Where possible, motor vehicles would be limited to maintained roads and designated routes.
- Vehicle speed within the project area, along ROW maintenance routes, and along existing access roads would not exceed 20 miles per hour. Speed limits would be clearly marked and all workers would be made aware of these limits.
- Constructed road berms would be less than 12 inches in height and have slopes of less than 30 degrees.
- Construction monitoring would employ a designated FCR, authorized biologist(s), and qualified biologist(s) approved by the BLM during the construction phase. At a minimum, qualified biologist(s) would be present during all activities in which encounters with tortoises could occur. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized biologist is defined as a wildlife biologist who has been authorized to handle desert tortoises by the USFWS. A FCR is defined as a person designated by the project proponent who is responsible for overseeing compliance with desert tortoise protective measures and for coordination with agency compliance officer(s).
- Preconstruction clearance surveys would be conducted within 48 hours of initiation of site-specific project activities, following USFWS protocol (USFWS 1992). The goal of a clearance survey is to find all tortoises on the surface and in burrows that could be harmed by construction activities. Surveys would cover 100 percent of the

acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity would be marked. Tortoise burrows would be avoided to the extent practicable, but would be excavated if they would be crushed by construction activities.

- Any tortoise found on the surface would be relocated to less than 1,000 feet away. Tortoises would be handled carefully following the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises would be handled with new latex gloves each time to avoid transmission of disease, and handlers would especially note guidelines for precautions to be taken during high-temperature periods.
- If a potential tortoise burrow were required to be excavated, the biologist would proceed according to the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises removed from burrows would be relocated to an artificial burrow (Desert Tortoise Council 1999). The entrance of the artificial burrow would be blocked until construction activities in the area were over (Desert Tortoise Council 1999).
- For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises might occur would be monitored by a qualified or authorized biologist. The biologist would be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The qualified or authorized biologist would watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and conduct other activities to ensure that death or injuries of tortoises were minimized.
- No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) would be left unfenced or uncovered; such hazards would be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term project areas would be enclosed with tortoise-proof fencing. Fencing would be removed when restoration of the site was completed.
- Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan would be documented immediately by the biological monitor. The FCR would ensure that appropriate corrective action was taken. Corrective actions would be documented by the monitor. The following incidents would require immediate cessation of the construction activities causing the incident, including (1) imminent threat of injury or death to a desert tortoise; (2) unauthorized handling of a desert tortoise, regardless of intent; (3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and (4) conducting any construction activity without a biological monitor where one was required. If the monitor and FCR did not agree, the federal agency's compliance officer would be contacted for resolution. All parties could refer the resolution to the federal agency's authorized officer.
- Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within two working days of when desert tortoises are harmed.
- All construction personnel, including subcontractors, would complete a WEAP. This instruction would include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by state and federal endangered species acts.
- Parked vehicles would be inspected prior to being moved. If a tortoise were found beneath a vehicle, the authorized biologist would be contacted to move the animal from harm's way, or the vehicle would not be moved until the desert tortoise left of its own accord. The authorized biologist would be responsible for taking

appropriate measures to ensure that any desert tortoise moved in this manner was not exposed to temperature extremes that could be harmful to the animal.

- Should any desert tortoise be injured or killed, all activities would be halted, and the FCR and/or authorized biologist immediately contacted. The FCR and/or authorized biologist would be responsible for reporting the incident to the authorizing agencies.
- A report to the USFWS would be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises would be reported.
- The applicant would implement a Raven Management Program that would consist of: (1) an annual survey to identify Raven nests on towers and any tortoise remains at tower locations; this information would be relayed to the BLM so that the Ravens and/or their nests in these towers could be targeted for removal, (2) SCE making an annual or one time contribution to an overall Raven reduction program in the California or Nevada desert, with an emphasis on Raven removal in the vicinity of this project.

APM BIO-12: Desert Bighorn Sheep Measures. The applicant would consult with the BLM, USFWS, and NDOW regarding conservation measures to avoid impacts on desert bighorn sheep during construction. Project areas with the potential to impact bighorn sheep include the proposed transmission line route through the McCullough Range and the telecommunication route segment in the southern Eldorado Valley between the Highland Range and the Southern McCullough Range. Avoidance and minimization measures could include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn sheep active seasons. Construction requiring the use of helicopters would be conducted outside of bighorn lambing season (April through October) and the dry summer months when bighorn may need to access artificial water sources north of the propose route in the McCullough Range (June through September).[1]

APM BIO-13: Western Burrowing Owl Measures. Where project ground-disturbing activities would occur prior to the Burrowing Owl breeding season (mid-March to August), all burrows, holes, crevices, or other cavities in suitable habitat on the project, within the limits of proposed ground disturbance, would be thoroughly inspected by a qualified biologist before being collapsed. This would discourage owls from breeding on the construction site. Other species using burrows would be relocated prior to collapsing burrows. If construction were to be initiated after the commencement of the breeding season and Burrowing Owls could be seen within areas to be affected by ground construction activities, a qualified biologist would observe behavior to determine their breeding status. If breeding were observed, the nest area would be avoided, with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the chicks fledged.

APM BIO-14: Gila Monster and Chuckwalla Measures. The following measures are the current NDOW construction site protocols for the Gila monster (NDOW 2005).[2] These protocols are applicable for the Gila monster in both the Nevada and California sections of the project, and applicable for the chuckwalla in the Nevada section of the project.

Through the WEAP, workers and other project personnel should (at a minimum) know how to (1) identify Gila monsters and distinguish them from other lizards such as chuckwallas and banded geckos, (2) report any observations of Gila monsters (in Nevada) to the biological monitor for notification of the NDOW, (3) be alerted to the consequences of a bite resulting from carelessness or unnecessary harassment, and (4) be aware of protective measures provided under state law.

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[1] The date of bighorn lambing season has been amended per MM BIO-13 to be January to May.

[2] The date of the most current NDOW Gila monster protocols has been amended per MM BIO-17 to be 2007.

- Live Gila monsters found in harm's way on the construction site would be captured and then detained in a cool, shaded environment (<85 degrees Fahrenheit) by the project biologist or equivalent personnel until an NDOW biologist could arrive for documentation purposes. Although a Gila monster is venomous and can deliver a serious bite, its relatively slow gait allows for it to be easily coaxed or lifted into an open bucket or box, carefully using a long handled instrument such as a shovel or snake hook (note: it is not the intent of NDOW to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistical points). A clean 5-gallon plastic bucket with a secure, vented lid; an 18-inch x 18-inch x 4-inch plastic sweater box with a secure, vented lid; or a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location (e.g., GPS record), date, time, and circumstances (e.g., biological survey or construction) and habitat description (vegetation, slope, aspect, and substrate) would also be provided to NDOW.
- Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. If a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Rehabilitation or euthanasia expenses would not be covered by NDOW. However, NDOW would be immediately notified during normal business hours. If an animal were killed or found dead, the carcass would be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, habitat, and mapped location.
- Should NDOW's assistance be delayed, biologists or equivalent acting personnel on site may be requested to remove and release the Gila monster out of harm's way. Should NDOW not be immediately available to respond for photo-documentation, a 35-mm camera or equivalent (5 mega-pixel digital minimum preferred) would be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures, preferably on slide film (.tif or .jpg digital format) would be provided to NDOW. Pictures would include the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).

3.5 Cultural Resources

Mitigation Measures

MM CR-1: Cultural Resources Monitoring. The applicant will retain a cultural resources monitor who meets the Secretary of the Interior Standards of a Qualified Professional Archaeologist prior to commencing construction or geotechnical test trenching on the project. The archaeologist will need to be approved by the BLM and will provide construction monitoring for any geotechnical studies that require trench excavation. As mentioned in APM GEO-1, five of the tower installations and 20 percent of the ground-trenching activities are in archaeologically sensitive areas. Monitoring in these areas will be determined by the BLM prior to construction.

Monitoring is necessary because a potential for cultural resources beneath desert pavement surfaces on alluvial planes was recently determined. Such conditions exist throughout much of the EITP project area. This monitoring effort would be used to protect potential resources and to provide data to help confirm or deny the theory of desert pavement development that would allow for buried cultural resources. BLM reserves the right to increase the amount of monitoring at any time if conditions reveal the necessity.

The archaeologist will present to the BLM for approval, no less than 60 days prior to commencement of construction, a monitoring plan; copies of which will also be submitted to the CPUC by the archaeologist. The archaeologist will also provide a report of findings after the monitoring has been completed. Because this geoarchaeological sensitivity has not been widely tested, the BLM is requiring only a small sample of monitoring at this time; further monitoring will only be required if the need is proven.

MM CR-2: Historic American Engineering Record (HAER) Recordation. Prior to construction of the EITP, the applicant will retain a cultural resources specialist qualified to conduct HAER recordation, meeting the Secretary of the Interior Standards. The qualified cultural resources specialist will conduct HAER recordation on Cultural Resource 36-10315 (CA-SBR-10315H). HAER recordation will be conducted in accordance the Secretary of the Interior's Standards for Architectural and Engineering Documentation, following Documentation Criteria Level II, as appropriate, for the level of significance assigned to the resources.

MM CR-3: Archaeological Resources Protection Act (ARPA) Training. Prior to construction, the applicant will provide ARPA training with the preconstruction Worker Environmental Awareness Program (WEAP; APM CR-2b). As required for the WEAP, ARPA training will be presented to all proposed project personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the National Register of Historic Places (NRHP). This includes construction supervisors as well as field construction personnel. No construction worker would be involved in ground-disturbing activities without having participated in the ARPA training portion of the WEAP.

Applicant Proposed Measures

APM CR-1: Conduct Archaeological Inventory of Areas that May Be Disturbed. Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the proposed project. A complete cultural resources inventory of the project area has been conducted, details of which are contained in a technical report. Should the project substantially change and areas not previously inventoried for cultural resources become part of the construction plan, the applicant would ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys would be conducted and documented according to applicable laws, regulations, and professional standards.

APM CR-2: Avoid and Minimize Impacts on Significant Cultural Resources Wherever Feasible. Avoid and minimize impacts on significant or potentially significant cultural resources wherever feasible. To the extent practical, the applicant would avoid or minimize impacts on archaeological resources, regardless of its California Register of Historic Resources (CRHR) or NRHP eligibility status. This includes siting all ground-disturbing activities and other project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the ROW.

APM CR-2a. Avoid Direct Impacts on Significant Cultural Resources through Project Final Design. Project Final Design would avoid direct impacts on significant or potentially significant cultural resources. To the extent practical, all ground-disturbing activities and other project components would be sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.

APM CR-2b. Conduct a Preconstruction Worker Environmental Awareness Program (see BIO-6, PALEO-3, and W-11). The program would be presented to all proposed project personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the CRHR or NRHP. This includes construction supervisors as well as field construction personnel. No construction worker would be involved in ground-disturbing activities without having participated in the WEAP.

APM CR-2c. Protective Buffer Zones. Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the ROW. A protective buffer zone would be established around each recorded archaeological site and treated as an "environmentally sensitive area" within which construction activities and personnel are not permitted. Monitoring would be conducted to ensure that the protective areas are maintained.

APM CR-3. Evaluate Significance of Unavoidable Cultural Resources. Evaluate the significance of all cultural resources that cannot be avoided. Cultural resources that cannot be avoided and which have not been evaluated to determine their eligibility for listing in the CRHR or NRHP would be evaluated to determine their historical significance. Evaluation studies would be conducted and documented according to applicable laws, regulations, guidelines, and professional standards.

APM CR-3a. Evaluate Significance of Potentially Eligible Archaeological Resources. Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing. Evaluation of archaeological sites could include scientific excavation of a sample of site constituents sufficient to understand the potential of a site to yield information to address important scientific research questions per CRHR eligibility Criterion 4 and NRHP eligibility Criterion D. Sites with rock art would be evaluated to consider their eligibility per CRHR Criterion 1 and NRHP Criteria A, C, and D.

APM CR-3b. Evaluate Significance of Potentially Eligible Buildings and Structures. Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation would take into account engineering, aesthetic, architectural, and other relevant attributes of each property. Buildings and structures would be evaluated for historical significance per CRHR eligibility Criteria 1, 2, and 3, and NRHP Criteria A, B, and C. A report of the evaluation of each building or structure would be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. The report would be filed with the appropriate Information Center of the California Historical Resources Information System.

APM CR-3c. Assist with Native American Consultations. If necessary, the applicant would assist the BLM in consultations with Native Americans regarding traditional cultural values that may be associated with locations within the Area of Potential Effect (APE). Archaeological or other cultural resources associated with the project may have cultural values ascribed to them by Native Americans. The applicant would assist the BLM during consultation with Native Americans regarding Native American cultural remains.

APM CR-4. Minimize Unavoidable Impacts on Significant Cultural Resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties. The applicant would make reasonable efforts to avoid adverse project effects to unique archaeological sites, historical resources, and historic properties. Nevertheless, it may not be possible to situate all proposed project facilities to completely avoid impacts on significant cultural resources. Impacts on significant cultural resources would be minimized by implementing the measures listed in APM CR-4a.

APM CR-4a. Implement Measures to Minimize Impacts on Significant Archaeological Sites. Prior to construction and during construction, the following measures would be implemented by the applicant to minimize unavoidable impacts on significant archaeological sites:

- To the extent practical, all activities would minimize ground surface disturbance within the bounds of significant archaeological sites, historical resources, or historic properties.
- Portions of significant archaeological sites, historical resources, or historic properties that can be avoided would be protected as environmentally sensitive areas and would remain undisturbed by construction activities.
- Monitoring by qualified professionals and/or Native Americans to ensure that impacts on sites are minimized would be carried out at each affected cultural resource for the period during which construction activities pose a potential threat to the site, and for as long as there is the potential to encounter unanticipated cultural or human remains.
- Additional archaeological studies would be carried out at appropriate sites to ascertain whether project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials.
- If impacts on significant archaeological (NRHP- or CRHR-eligible) sites eligible under NRHP Criterion D or CRHR Criterion 4 cannot be avoided, archaeological data recovery would be carried out in the portions of affected significant sites that would be impacted. A data recovery plan would be prepared, reviewed by the appropriate agencies, and then implemented in order to recover an adequate sample of cultural remains that can be used to address important eligibility research questions for CRHR Criterion 4 or NRHP Criterion D. Archaeological data recovery would involve scientific excavations; identification of recovered cultural and ecological remains; cataloging, scientific analysis, and interpretation of recovered materials; and preparation of a scientific technical report that describes the methods and results of the data recovery program.

- Reports of any excavations at archaeological sites would be filed with the BLM and the appropriate Information Center of the California Historical Resources Information System.

APM CR-4b. Implement Measures to Minimize Impacts on Significant Buildings and Structures. Prior to construction and during construction, the applicant would implement the following measures to minimize unavoidable impacts on significant buildings and structures:

- Locate proposed project facilities to minimize effects on significant buildings or structures.
- If impacts on significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with the documentation standards of the National Park Service Historic American Buildings Survey/Historic American Engineering Record.
- File reports and other documentation with the BLM, the National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.

APM CR-5. Prepare and Implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan. During construction it is possible that previously unknown archaeological or other cultural resources or human remains could be discovered. Prior to construction, the applicant would prepare a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan to be implemented if an unanticipated discovery is made. At a minimum the plan would detail the following elements:

- Worker and supervisor training in the identification of cultural remains that could be found in the proposed project area, and the implications of disturbance and collection of cultural resources pursuant with the Archaeological Resources Protection Act of 1979;
- Worker and supervisor response procedures to be followed in the event of an unanticipated discovery, including appropriate points of contact for professionals qualified to make decisions about the potential significance of any find;
- Identities of persons authorized to stop or redirect work that could affect the discovery, and their on-call contact information;
- Procedures for monitoring construction activities in archaeologically sensitive areas;
- A minimum radius around any discovery within which work would be halted until the significance of the resource has been evaluated and mitigation implemented as appropriate;
- Procedures for identifying and evaluating the historical significance of a discovery;
- Procedures for consulting Native Americans when identifying and evaluating the significance of discoveries involving Native American cultural materials; and
- Procedures to be followed for treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans.

APM CR-6. Inadvertent Discovery of Human Remains. Any human remains discovered during project activities in California would be protected in accordance with current state law, specifically Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Assembly Bill 2641. If human remains determined not to be Native American are unclaimed, they would be treated under the appropriate State of Nevada statutes, including but not limited to Nevada Revised Statutes Chapter 440 and the regulations of the applicable land management agency. In the event that human remains are recovered on private lands, the landholder would have the right to designate the repository for the remains if they are determined not to be Native American or if their family affiliation cannot be determined.

The provisions of the Native American Grave Protection and Repatriation Act are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains would be treated as defined in the Construction Monitoring and Unanticipated Cultural Resources Discovery Plan.

APM CR-7. Native American Participation. Prior to construction, the BLM would consult with Native Americans identified by the Native American Heritage Commission (NAHC) as having cultural ties to particular areas of the proposed project. Native Americans would be invited to participate in significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, as well as in monitoring during project construction. Native Americans would be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during project activities.

3.6 Geology, Soils, Minerals, and Paleontology

Mitigation Measures

MM GEO-1: Monitor and Mitigate Damage to Tower Structures. SCE will contact the California Department of Water Resources and the Nevada Division of Water Resources on an annual basis to determine if groundwater withdrawals pose a potential for threatening to cause ground subsidence within the project area. If physical evidence proves groundwater withdrawals are threatening tower locations, SCE will develop a plan, following their operations and maintenance policies, to mitigate potential damage to tower structures using standard foundation remediation techniques available.

MM GEO-2: Geotechnical Engineering Study. The applicant will prepare a geotechnical engineering study prior to the final project design to identify site-specific geological conditions and potential geologic hazards. The data collected from the study will be used to guide sound engineering practices and to mitigate potential geologic hazards.

MM GEO-3: Preparation and Implementation of a Stormwater Pollution Prevention Plan (SWPPP). The applicant will prepare a SWPPP for review and approval by the Lahontan Regional Water Quality Control Board (Region 6) and the Clark County Stormwater Quality Management Committee that addresses construction and post-construction project-related ground disturbances and associated erosion. The plan will provide the necessary engineering controls and procedures to minimize impact to the ground surface caused by construction, operation, and maintenance activities. A copy of the approved plan will also be submitted to the CPUC.

MM GEO-4: Expansive Soils Mitigation. The applicant will prepare a geotechnical study of the areas of expansive soil(s) identified in APM GEO-1 to develop appropriate design and mitigation measures prior to construction.

Applicant Proposed Measures

APM GEO-1: Geotechnical Engineering and Engineering Geology Study. Prior to final design of substation facilities and transmission and subtransmission line tower foundations, a combined geotechnical engineering and engineering geology study would be conducted to identify site-specific geologic conditions and potential geologic hazards in sufficient detail to support sound engineering practices.

APM GEO-2: Recommended Practices for Seismic Design of Substations. For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronics Engineers Standard 693, "Recommended Practices for Seismic Design of Substations," which includes probabilistic earthquake hazard analysis. Other project elements would be designed and constructed in accordance with the appropriate industry standards, as well as good engineering and construction practices and methods.

APM GEO-3: Project Construction Stormwater Pollution Prevention Plan Protection Measures Regarding Soil Erosion/Water Quality. Transmission line and substation construction activities would be conducted in accordance with the soil erosion/water quality protection measures to be specified in the project construction SWPPP. New access roads would be designed to minimize ground disturbance from grading. They would follow natural ground contours as closely as possible, and would include specific features for road drainage. Measures could include water bars, drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings would be constructed, they would be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.

APM PALEO-1: Retention of Paleontologist and Preparation of a Paleontological Resource Management Plan. Prior to construction, a certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a Paleontological Resource Management and Monitoring Plan (PRMMP) for the proposed project. This PRMMP would be prepared and implemented under the direction of the paleontologist and would address and incorporate APMs PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine whether fossils are present. The monitor would have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens. More specific guidelines for paleontological resource monitoring could be found in the PRMMP.

APM PALEO-2: Pre-construction Paleontological Field Survey. The paleontologist and/or his or her designated representative would conduct a pre-construction field survey of the project area underlain by Tertiary rock units and older alluvium. Results of the field inventory and associated recommendations would be incorporated into the PRMMP.

APM PALEO-3: Worker Environmental Awareness Program (see BIO-6, CR-2b, W-11). A Worker Environmental Awareness Program would be provided to construction supervisors and crew for awareness of requirements regarding the protection of paleontological resources and procedures to be implemented in the event fossil remains are encountered by ground-disturbing activities.

APM PALEO-4: Construction Monitoring. Ground-disturbing activities would be monitored on a part-time or full-time basis by a paleontological construction monitor only in those parts of the project area where these activities would disturb previously undisturbed strata in rock units of moderate and high sensitivity. Quaternary alluvium, colluvium, and Quaternary landslide deposits have a low paleontological sensitivity level and would be spot-checked on a periodic basis to ensure that older underlying sediments were not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities had reached a depth 5 feet below the present ground surface and fine-grained strata were present. Ground-disturbing activities in areas underlain by rock units of low sensitivity would be monitored on a quarter-time basis or spot-checked if fine grained strata were present.

APM PALEO-5: Recovery and Testing. If fossils were encountered during construction, construction activities would be temporarily diverted from the discovery and the monitor would notify all concerned parties and collect matrix for testing and processing as directed by the project paleontologist. In order to expedite removal of fossil-bearing matrix, the monitor may request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction would resume at the discovery location once the necessary matrix was stockpiled, as determined by the paleontological monitor. Testing of stockpiles would consist of screen washing small samples to determine if important fossils were present. If such fossils were present, the additional matrix from the stockpiles would be water screened to ensure recovery of a scientifically significant sample. Samples collected would be limited to a maximum of 6,000 pounds per locality.

APM PALEO-6: Monthly Progress Reports. The project paleontologist would document interim results of the construction monitoring program with monthly progress reports. Additionally, at each fossil locality, field data forms would record the locality, stratigraphic columns would be measured, and appropriate scientific samples would be submitted for analysis.

APM PALEO-7: Analysis of and Preparation of Final Paleontological Resource Recovery Report. The project paleontologist would direct identification, laboratory processing, cataloging, analysis, and documentation of the fossil collections. When appropriate, and in consultation with SCE, splits of rock or sediment samples would be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. After analysis, the collections would be prepared for curation (see APM PALEO-8). A final technical report would be prepared to summarize construction monitoring and present the results of the fossil recovery program. The report would be prepared in accordance with SCE, Society of Vertebrate Paleontology guidelines, and lead agency requirements. The final report would be submitted to SCE, the lead agency, and the curation repository.

APM PALEO-8: Curation. Prior to construction, SCE would enter into a formal agreement with a recognized museum repository, and would curate the fossil collections, appropriate field and laboratory documentation, and final Paleontological Resource Recovery Report in a timely manner following construction.

3.7 Hazards, Health, and Safety

Mitigation Measures

MM HAZ-1: Worker Health and Safety and Environmental Training and Monitoring Program. Prior to construction, the applicant will conduct a worker safety and environmental training program. As part of the program, the applicant will develop and implement a Health and Safety Plan. The Health and Safety Plan should address all potential situations that workers could encounter during construction and maintenance, including safety issues that may be unique to any of the alternatives. The Health and Safety Plan, at minimum, must require that first aid kits be stored in each construction vehicle and that a worker trained in first aid be included in each work group. The purpose and goal of the worker safety and environmental training will be to communicate project-related environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and BMPs, to all field and construction personnel prior to the start of construction. Training will also encompass environmental training related to road designations, speed limits, and restrictions on camping within the surrounding Boulder City Conservation Easement to ensure compatibility with neighboring land uses, promote "good neighbor" policies, and institute BMPs for construction. SCE will also conduct health and safety training for Operation and Maintenance activities.

MM HAZ-2: Comply with Federal Aviation Administration (FAA) Requirements Upon Construction of the SNSA. The applicant will comply with all FAA requirements upon construction of the Southern Nevada Supplemental Airport (SNSA).

MM HAZ-3: Agency Coordination and Approvals. Before initiating the Phase I Environmental Site Assessment, site investigation under the Soil Management Plan, and/or any remediation work, the applicant will develop and submit a work plan to the appropriate federal, state, and local regulatory authority to oversee hazardous waste investigations or cleanups. No work will begin without approval of the appropriate regulatory authorities. The applicant will submit results of all analytical reports to the appropriate regulatory authorities in a report that summarizes the sampling results in reference to regulatory standards. The applicant will submit all closure certification or remediation approval reports to the appropriate regulatory authorities.

MM HAZ-4: Disposal of Demolition Materials. All debris generated during project-related demolition of structures, buildings, asphalt, or concrete-paved surface areas must be tested for the presence of hazardous chemicals, mercury, asbestos, and any other materials that may be deemed hazardous before disposal. The applicant will ensure that the materials are properly disposed of depending on the sampling results.

MM HAZ-5: Backfill Material. If backfill material is used, it will be sampled and determined to be contaminant-free before it is used to fill excavations.

MM HAZ-6: EPA Identification Number. If it is determined that hazardous waste will be generated during construction, the applicant will obtain an EPA Identification Number before construction begins. Before construction begins, the applicant will also determine whether the treatment or the handling or the storing of hazardous materials will require authorization of the local Certified Unified Program Agency (CUPA). If necessary, the applicant must receive authorization from the local CUPA before construction begins.

Applicant Proposed Measures

APM HAZ-1: Phase I Environmental Site Assessment. A Phase I Environmental Site Assessment would be performed at each new or expanded substation location and along newly acquired transmission or subtransmission line ROWs. The Phase I Environmental Site Assessment would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to a company which specializes in this type

of work and who would produce a comprehensive report (Report) for the new or expanded ROW. The Report is used to identify sites located on federal, state, and local government agency databases which may have the potential to impact the proposed project.

The Report would be reviewed and, based on such review, any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I Environmental Site Assessment which is compliant with ASTM 1927-05 (ASTM 2005) would be performed on all property to be acquired.

Based on the results of the Phase I Environmental Site Assessment, additional assessment, characterization, and remediation of potential or known subsurface impacts may be conducted prior to construction activities. Such remediation could include the relocation of transmission line structures as necessary to avoid impacted areas, or the removal and disposal of impacted soils and/or groundwater according to applicable regulations.

APM HAZ-2: Hazardous Materials and Waste Handling Management. Hazardous materials used and stored onsite for the proposed construction activities, as well as hazardous wastes generated onsite as a result of the proposed construction activities, would be managed according to the specifications outlined below as follows:

- **Hazardous Materials and Hazardous Waste Handling Program:** A project-specific hazardous materials management and hazardous waste management program would be developed prior to initiation of the project. The program would outline proper hazardous materials use, storage and disposal requirements, as well as hazardous waste management procedures. The program would identify types of hazardous materials to be used during the project and the types of wastes that would be generated.

  All project personnel would be provided with project-specific training. This program would be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes would be handled and disposed of according to applicable rules and regulations. Employees handling wastes would receive hazardous materials training and shall be trained in: hazardous waste procedures; spill contingencies; waste minimization procedures; and toxic substance disposal facility (TSDF) training in accordance with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard and 22 CCR. SCE would use landfill facilities that are authorized to accept treated wood pole waste in accordance with HSC 25143.1.4(b).

- **Construction Stormwater Pollution Prevention Plan:** A project-specific construction SWPPP would be prepared and implemented prior to the start of construction of the transmission line and substations. The SWPPP would use BMPs to address the storage and handling of hazardous materials and sediment runoff during construction activities.

- **Transport of Hazardous Materials:** Hazardous materials that would be transported by truck include fuel (diesel fuel and gasoline), and oil and lubricants for equipment. Containers used to store hazardous materials would be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used would be established in accordance with the United States Department of Transportation (USDOT), the California Department of Transportation (CalTrans), and Nevada Department of Transportation (NDOT) regulations. A qualified transporter would be selected to comply with federal and state transportation regulations.

- **Fueling and Maintenance of Construction Equipment:** Written procedures for fueling and maintenance of construction equipment would be prepared prior to construction. Vehicles and equipment would be refueled onsite or by tanker trucks. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground.

  Refueling stations would be located in designated areas where absorbent pads and trays would be available. The fuel tanks would also contain a lined area to ensure that accidental spillage does not occur. Drip pans or other collection devices would be placed under the equipment at night to capture drips or spills. Equipment would be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants would be kept in an approved locker or storage cabinet.

- **Fueling and Maintenance of Helicopters:** Written procedures for fueling and maintenance of helicopters would be prepared prior to construction. Helicopters would be refueled at helicopter staging areas or local airports. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling areas would be located in designated areas where absorbent pads and trays are available.
- **Emergency Release Response Procedures:** An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, would be immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain if the spill impacted any sensitive area, including conservation areas and wildlife preserved, or if the spill causes injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.

APM HAZ-3: Soil Management Plan. A Soil Management Plan would be developed and implemented for construction of the project. The objective of the Soil Management Plan is to provide guidance for the proper handling, onsite management, and disposal of impacted soil that might be encountered during construction activities. The plan would include practices that are consistent with the California Title 8, OSHA regulations, as well as appropriate remediation standards that are protective of the planned use. Appropriately trained professionals would be onsite during preparation, grading, and related earthwork activities to monitor soil conditions encountered. The Soil Management Plan would provide guidelines for the following:

- Identifying impacted soil,
- Assessing impacted soil,
- Soil excavation,
- Impacted soil storage,
- Verification sampling, and
- Impacted soil characterization and disposal.

In the event that potentially contaminated soils were encountered within the footprint of construction, soils would be tested and stockpiled. In California, the CUPA would determine whether further assessment is warranted. In Nevada, the Nevada Department of Environmental Protection (NDEP) BCA Spill Hotline (888-331- 6337) would be contacted if the quantity of impacted material is greater than 3 cubic yards.

APM HAZ-4: Fire Management Plan. The Fire Management Plan developed by SCE and presented in the PEA as Appendix K would be implemented.

APM HAZ-5: Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan.

- **Spill Prevention, Countermeasure, and Control Plan (SPCC).** In accordance with Title 40 of the CFR, Part 112, SCE would prepare a SPCC Plan for proposed and/or expanded substations. The plan would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup.
- **Hazardous Materials Business Plans (HMBPs).** Prior to operation of new or expanded substations, SCE would prepare or update and submit, in accordance with Chapter 6.95 of CCR and Title 22 CCR, a HMBP. The required documentation would be submitted to the designated CUPA in California (an HMBP or similar documentation is not required by the State of Nevada.) The HMBPs would include hazardous materials and hazardous waste management procedures, and emergency response procedures including emergency spill cleanup supplies and equipment.

3.8 Hydrology and Water Quality

Mitigation Measures

MM W-1: Erosion Control Plan and Compliance with Water Quality Permits. The applicant will employ a professional engineer to develop and implement an Erosion Control Plan and monitor construction activities to ensure compliance with federal and state water quality permits. The Erosion Control Plan will comply with or exceed BMPs commonly used on projects in the California/Nevada area and those outlined in county plans. Copies of the Erosion Control Plan will be submitted to CPUC. MM W-1 will also serve to strengthen APMs W-1, W-4, and W-5 to include all intermittent and ephemeral streams and desert washes as depicted on United States Geological Survey (USGS) and National Hydrography Dataset (NHD) mapping and those identified during the applicant's field reconnaissance surveys. The intent of this MM is to minimize the impact of construction on surface water quality in the basins surrounding the proposed project. This MM will apply to all construction sites for the duration of construction and restoration activities.

MM W-2: Water Use Maximum. The applicant has estimated using a maximum of between 32,000 and 40,000 gallons per day of water for the construction phase of the project. This translates to between 30.6 and 38.3 acre-feet/year. The applicant has stated that no water would be used during the operational phase of the project. Under MM W-2, the applicant will limit construction phase water use to a maximum of 45 acre feet per annum. The applicant will not use water during the operational phase of the project. Emergency water uses, including fire suppression, are excluded from these maxima. If the applicant requires additional water for construction or operation of the project, the applicant must submit a request to the CPUC and the BLM.

MM W-3: Onsite Flow Model and Channel System. The applicant will employ a hydrologist to develop an Onsite Flow Model to predict any alteration in flow path that would result from construction and operation and maintenance of the proposed project. The applicant will also develop a channel system to prevent erosion and to mitigate altered flow paths. The Onsite Flow Model and channel system design will be submitted to the CPUC for review at least three months prior to the start of construction. The intent of this MM is to ensure that stormwater runoff will not cause flooding. The applicant will monitor the channel system throughout construction to assess effectiveness and ensure compliance with the designed system. Additionally, the applicant will coordinate with BLM and CPUC on model parameters and assumptions used in modeling.

MM W-4: Dry Lake Restoration Plan. The applicant will employ a hydrologist and a restoration specialist to develop a Restoration Plan for disturbance of dry lake beds. The proposed project would cross through Ivanpah Lake. Construction would disturb the flat dry lake bed surface that is used for recreation. The intent of this MM is to ensure that the dry lake bed is restored to preconstruction conditions. The BLM will review the plan prior to the start of construction. The BLM would also assess the success of the restoration and determine whether the Ivanpah Lake surface had been restored to preconstruction conditions. In addition, the applicant will coordinate with the BLM the submission of the plan to the CDFG for review. The applicant will provide the CPUC with a copy of the Restoration Plan.

MM W-5: Historical Hydrological Model of Alluvial Fan. In the PEA, the applicant completed a historical hydrological model on site area alluvial fan(s) based on similar work on alluvial fans performed near Laughlin, Nevada (House 2005). The applicant extrapolated the data by applying the methodology from the Laughlin area model to the California portion of the project area. This study will be used to determine the active and inactive portions of the alluvial fans in the site area relative to surface water, sediment transport, and flash flooding. Where feasible, the applicant will locate towers, substations, and other permanent site features on inactive portions of the alluvial fan to minimize risk associated with flash flooding and alluvial fan failure.

MM W-6: DESCP, SWPPP, and Grading and Storm Water Management Plan for Ivanpah Substation. The applicant will be required to submit copies of the approved Drainage, Erosion, and Sediment Control Plan (DESCP) and Storm Water Pollution Prevention Plan (SWPPP) to CPUC three months prior to the start of construction, and implement those plans as part of the EITP.

Applicant Proposed Measures

APM W-1: Avoid Stream Channels. Construction equipment would be kept out of flowing stream channels.

APM W-2: Erosion Control and Hazardous Material Plans. Erosion control and hazardous material plans would be incorporated into the construction bidding specifications to ensure compliance.

APM W-3: Project Design Features. Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, would be used to prevent scour and/or inundation by a 100-year flood. Where floodplain encroachment is required by the CPUC and/or the BLM, and potential impacts require non-standard designs, hydrology/channel flow analysis would be performed.

APM W-4: Avoid Active Drainage Channels. Towers would be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows.

APM W-5: Diversion Dikes. Diversion dikes would be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) could not be avoided; and (b) where there is a very significant flood scour/deposition threat, unless such diversion is specifically exempted by the CPUC and/or the BLM Authorized Officer.

APM W-6: Collect and Divert Runoff. Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes.

APM W-7: Ditch and Drainage Design. Ditches and drainage devices would be designed to handle the concentrated runoff and located to avoid disturbed areas. They would have energy dissipations at discharge points that might include rip-rap, concrete aprons, and stepped spillways. Where diversion dikes are required to protect towers or other project structures from flooding or erosion, these dikes would be designed to avoid increasing the risk of erosion or flooding onto adjacent property.

APM W-8: Minimize Cut and Fill Slopes. Cut and fill slopes would be minimized by a combination of benching and following natural topography where possible.

APM W-9: Prepare and Implement an Approved SWPPP. As a part of the SWPPP, soil disturbance at tower construction sites and access roads would be the minimum necessary for construction and designed to prevent long-term erosion through the following activities: restoration of disturbed soil, re-vegetation, and/or construction of permanent erosion control structures. BMPs in the project SWPPP would be implemented during construction to minimize the risk of an accidental release.

APM W-10: Emergency Release Response Procedures. The Emergency Release Response Procedures developed pursuant to APM HAZ-1 would be maintained onsite (or in vehicles) during construction of the project.

APM W-11: Conduct a Worker Environmental Awareness Program (see BIO-6, CR-2b, PALEO-3). A Worker Environmental Awareness Program (WEAP) would be conducted to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and proper BMP implementation, to all field personnel prior to the start of construction. This training program would emphasize site-specific physical conditions to improve hazard prevention. It would include a review of all site-specific plans, including but not limited to the project's SWPPP and Hazardous Substances Control and Emergency Response Plan. The applicant would document compliance and maintain a list of names of all construction personnel who had completed the training program.

APM W-12: Properly Dispose of Hazardous Materials. All construction and demolition waste, including trash and litter, garbage, and other solid waste, would be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials would be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.

APM W-13: Identify Location of Underground Utilities Prior to Excavation. Prior to excavation, the applicant or its contractors would locate overhead and underground utility lines, such as natural gas, electricity, sewage,

telephone, fuel, and water lines, or other underground structures that may reasonably be expected to be encountered during excavation work.

APM W-14: Prepare or Update Spill Prevention, Control, and Countermeasure (SPCC) Plans. The applicant would prepare or update SPCC plans for substations to minimize, avoid, and/or clean up unforeseen spill of hazardous materials during facility operations.

3.9 Land Use

Mitigation Measures

MM LU-1: Obtain Approval from Clark County and the City of Boulder City for Activities Outside of BLM-Designated Utility Corridors in the BCCE. Prior to construction, the applicant must consult with and obtain permission from Clark County and the City of Boulder City regarding construction outside of BLM-designated utility corridors in the BCCE. In addition, the applicant will comply with all land use restrictions, such as speed limits, in consultation with the BCCE, and will fully comply with the Amendment to the Interlocal Agreement, including Exhibit D. The applicant will submit a record of this consultation to the BLM and the CPUC prior to construction.

Applicant Proposed Measures

APM LU-1: Aeronautical Considerations. The applicant would submit notice to FAA electronically, in accordance with FAA procedures, and as far in advance of construction as possible.

3.10 Noise

Mitigation Measures

MM NOI-1: Conduct Construction Activities during Daytime Hours. The applicant will conduct construction activities only during daytime hours (7 a.m. to 7 p.m.) while in the vicinity of the Desert Oasis Apartment Complex.

MM NOI-2: Relocate Stationary Construction Equipment. The applicant will locate stationary construction equipment at a site location that is as far away from the Desert Oasis Apartment Complex as is feasible.

MM NOI-3: Turn off Idling Equipment. The applicant will turn off idling equipment when not in use.

MM NOI-4: Notify Adjacent Residences. The applicant will notify residents within 200 feet of the transmission line in advance of construction work.

MM NOI-5: Install Acoustic Barriers. The applicant will install acoustic barriers around stationary construction noise sources near sensitive receptors.

Applicant Proposed Measures

APM NOI-1: Compliance with Local Noise Ordinances. The proposed construction would comply with local noise ordinances. There may be a need to work outside the aforementioned local ordinances to take advantage of low electrical draw periods during the nighttime hours. The applicant would comply with variance procedures requested by local authorities if required.

APM NOI-2: Construction Equipment Working Order. Construction equipment would be in good working order.

APM NOI-3: Construction Equipment Maintenance. Construction equipment would be maintained per manufacturer's recommendations.

APM NOI-4: Construction Equipment Muffled. Construction equipment would be adequately muffled.

APM NOI-5: Construction Equipment Idling Minimized. Idling of construction equipment and vehicles would be minimized during the construction.

APM NOI-6: Hearing Protection for Workers. Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan.

3.11 Public Services and Utilities

Mitigation Measures

MM PUSVC-1: Construction Waste Disposal Plan. The applicant will prepare a Construction Waste Disposal Plan for all nonhazardous wastes generated during construction of the proposed project and submit the plan to the BLM and the CPUC for review and approval no less than 30 days prior to start of construction. The plan will contain the following, at a minimum:

A description of all nonhazardous solid and liquid construction wastes, including:

- Estimated amounts to be disposed of in a landfill by weight or volume and;
- Estimated amounts that can be recycled or salvage by weight or volume;
- Recycling, salvage, and waste minimization/source reduction plans;
- Management methods to be used for each type of waste, including temporary onsite storage, housekeeping and BMPs to be employed, and methods of transportation and packaging; and
- A description and list of all contracts and plans made with waste contractors, landfills, and wastewater treatment facilities.

The applicant may refer to internal salvage and waste manuals in the Construction Waste Management Plan where applicable. The plan is necessary to ensure that solid waste is recycled or salvaged to the maximum extent possible. In addition, the applicant would need to observe the Nevada Legislature's goal to recycle 25 percent of total solid waste generated within each municipality of Nevada.

MM PUSVC-2: Notification of Utility Service Interruption. If a utility service interruption is known to be unavoidable, the applicant will notify by postal mail members of the public, the jurisdiction, and the service providers who would be affected. The applicant will also publish notices in newspapers circulated in each jurisdiction that would be affected. The postal mail and newspaper notices will specify the estimated duration of each service interruption and be mailed or published no later than seven days prior to the first interruption. Copies of the notices will be provided to the BLM and CPUC no later than 30 days following notification.

Applicant Proposed Measures

APM PUSVC-1: Work Around High Pressure Pipelines. No mechanical equipment will be permitted to operate within 3 feet of the high-pressure pipelines, and work within 3 feet must be done by hand or as otherwise directed by the pipeline company.

APM PUSVC-2: Monitoring by Pipeline Companies. A representative of applicable owners and operators of major pipeline companies must observe the excavation around or near their facilities to ensure protection and to record pertinent data necessary for operations.

3.12 Recreation

Mitigation Measures

MM REC-1: Limit Construction Workspace in Wildlife and Recreational Areas. The applicant will not site extra workspace areas such as contractor yards in Recreation Areas to minimize impacts on recreational users during construction. In addition, the applicant will coordinate with the BLM, as well as organizers of BLM-permitted races and events in the project area, to ensure that project construction will not interrupt events.

MM REC-2: Notify the Nevada Department of Wildlife of Any Road Closures During Hunting Season. To allow access for hunters in the area, the applicant will not close the southern ROW of the McCullough Pass during construction. The applicant will notify NDOW of any road closures during hunting season at least 30 days prior to closure.

MM REC-3: Display Appropriate "Closed" Signage for New Spur and Access Roads Constructed. The applicant will coordinate with BLM Field Offices on displaying appropriate "closed" signage at the entrance to new spur roads to tower locations and access roads. This includes temporary signs during the construction phase of the project and permanent signs and/or vehicle barriers that will close the spur routes to public travel.

Applicant Proposed Measures

APM REC-1: Recreation Area Closures. When temporary short-term closures to recreational areas are necessary for construction activities, the applicant would coordinate those closures with recreational facility owners. To the extent practicable, the applicant would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). The applicant would post notice of the closure onsite 14 calendar days prior to the closure.

3.14 Transportation and Traffic

Mitigation Measures

MM TRANS-1: No Lane Closures on I-15 during Friday Peak Usage. The applicant will limit construction activities on Friday afternoon from noon to 10 p.m. so as not to require lane closures on I-15.

MM TRANS-2: Helicopter Flight Plan and Safety Plan. At least 30 days prior to construction of the project, the applicant will coordinate with the FAA for review and approval of any helicopter flight plans that would take place during construction and operation. The applicant will then provide information to the BLM and the CPUC regarding the intended need and use of helicopters during construction and operation of the project, including the flight and safety plan; the number of days and hours that the helicopter would operate; the type and number of helicopters that would be used; the location, size, and number of staging areas for helicopter take off and landing; and written approval from property owners for use of helicopter staging areas. The applicant will review the helicopter flight and safety plan with the FAA and the Clark County Department of Aviation (CCDOA) at least 30 days prior to the start of SNSA construction and resubmit the revised plan to the BLM and the CPUC.

MM TRANS-3: Traffic Control Plan. Prior to start of construction of the EITP, the applicant will prepare and implement a Traffic Control Plan for the project to address staggering of deliveries on I-15 during peak traffic times.

Applicant Proposed Measures

APM TRA-1: Obtain Permits. If any work requires modifications or activities within local roadway and railroad ROWs, appropriate permits will be obtained prior to the commencement of construction activities, including any necessary local permits and encroachment permits.

APM TRA-2: Traffic Management and Control Plans. Traffic control and other management plans will be prepared where necessary to minimize project impacts on local streets and railroad operations.

APM TRA-3: Minimize Street Use. Construction activities will be designed to minimize work on, or use of, local streets.

DRAFT Mitigation Monitoring Compliance Reporting Program

1. Overview and Purpose

The Environmental Impact Report/ Environmental Impact Statement (Final EIR/EIS) for the Southern California Edison's (SCE) Eldorado-Ivanpah Transmission Project (EITP), as adopted by the California Public Utilities Commission (CPUC) and the Bureau of Land Management (BLM), includes procedures for preparing and implementing a Mitigation Monitoring, Compliance, and Reporting Program (MMCRP) to ensure compliance with mitigation measures approved in the Final EIR/EIS. Chapter 9 of the Final EIR/EIS provides the recommended framework for the implementation of the MMCRP by the California Environmental Quality Act (CEQA) Lead Agency (CPUC) and the National Environmental Policy Act (NEPA) Lead Agency (BLM), and describes the roles and responsibilities of responsible agencies in implementing and enforcing adopted mitigation measures. This MMCRP includes the information provided in Chapter 9, as well as specific protocols, guidelines, and standardized procedures for environmental compliance to be followed prior to and during construction by a CPUC and BLM third-party Compliance Manager (CM), CMs that report to the CPUC/BLM CM, and SCE Environmental monitors and project staff. The goal of the MMCRP is to provide a clear understanding of the project's organization, establish lines of communication related to mitigation monitoring, and establish a method to effectively document and report compliance with all of the mitigation measures.

The project's MMCRP includes direct participation and commitment from EITP and the CPUC/BLM CM and Compliance Monitors. The success of the program depends on cooperation between the project management staff, monitors, and construction contractor personnel. The procedures have been developed in coordination with SCE, CPUC, BLM, and Compliance Monitors to help define the reporting protocol, provide detailed information about the roles and responsibilities of the project's environmental compliance team members, define compliance reporting procedures, and establish a communication protocol.

1.1 Regulatory Background

Under CEQA Guidelines Section 15097, for any project for which Findings are made in conjunction with approval of the project, the Lead Agency (in this case, the CPUC) is responsible for developing a mitigation monitoring or reporting program to ensure that all project revisions and mitigation measures described in the Findings are implemented. Monitoring, which refers to the ongoing or periodic oversight process, ensures that project compliance is checked on a regular basis; reporting, which comprises written compliance reviews presented to the decision-making body or a designated staff person, ensures that the approving agency is informed of compliance with the mitigation requirements. The CPUC views the MMCRP as a working guide to facilitate not only the implementation of mitigation measures by SCE, but also the monitoring, compliance, and reporting activities of the CPUC and its monitors. The CEQA Guidelines encourage cooperation in mitigation monitoring and reporting between lead and responsible agencies, where possible.

The Council on Environmental Quality (CEQ) Regulations, which are issued pursuant to NEPA, state that a Lead Agency (in this case, the BLM) may "provide for monitoring to assure that their decisions are carried out and should do so in important cases" (40 CFR 1505.3). The CEQ Regulations further state that for decisions based on an EIS, "a monitoring and enforcement program shall be adopted...where applicable for any mitigation" ((40 CFR 1505.2). On January 14, 2011, the CEQ released a memorandum on the appropriate use of mitigation and monitoring. The memorandum provides recommendations on how to ensure that mitigation commitments are implemented; how to monitor the effectiveness of mitigation commitments; how to remedy failed mitigation; and how to involve the public in mitigation planning.

This document was prepared in compliance with both CEQA Guidelines and CEQ Regulations to fulfill the CPUC's and BLM's mitigation monitoring and reporting obligations under CEQA and NEPA, respectively.

1.2 Project Overview

1.2.1 Construction Components

The project has been divided into three components, as shown in Table 1.

Table 1: Summary of EITP Components

EITP Major Components		Features	Location/ Extension
Powerlines	Eldorado–Ivanpah Transmission Line	Double-circuit 230-kV line replacing a portion of the existing Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line	Nevada: 28 miles California: 7 miles
	Subtransmission Line	Single-circuit 115-kV line connecting the Ivanpah Substation to the existing 115-kV Eldorado–Baker–Cool Water–Dunn Siding–Mountain Pass 115-kV transmission line	California: 600 to 800 feet
	Distribution Lines	• Additional 33-kV distribution circuitry to provide power to Ivanpah Substation; and • New 33-kV overhead line to supply light and power to the proposed microwave communication site (northeast of Nipton)	California (total length of 33-kV line): approximately 5,200 feet of underground and 5,900 feet of overhead
Substations	Ivanpah Substation	Connector hub for solar energy generated in the Ivanpah Valley area. Major components: • 230-kV and 115-kV switchracks • Mechanical and electrical equipment room • Microwave tower	California (near Primm, Nevada): 1,650 by 1,015 feet
	Eldorado Substation Upgrades	Extension of the existing switchyard to install two 230-kV line positions to accommodate the new double-circuit line	Nevada (14 miles from Boulder City)
Telecommunication System	Fully diverse and redundant telecommunication paths: • Optical ground wire • Combined optical ground wire and microwave	Support the Special Protection System (SPS) under specific outage contingencies, and the operation and monitoring of the substation and transmission line equipment Overhead optical ground wire path: • Path 1: Overhead optical ground wire along the Eldorado–Ivanpah alignment • Path 2, Section 1: Overhead optical ground wire along the Eldorado–Lugo transmission line Combined optical ground wire and microwave path: • Path 2, Section 2: Underground duct between Eldorado–Lugo 500-kV line and a new communication site in Nipton, California • Path 2, Section 3: Microwave telecommunication path between Nipton and the Ivanpah Substation	Path 1 (overhead) Nevada: 28 miles California: 7 miles Path 2, Section 1 (overhead) Nevada: 25.5 miles Path 2, Section 2 (underground) California: 3 miles Nevada: 2 miles Path 2, Section 3 (microwave) California: 12 miles

Table 1: Summary of EITP Components

EITP Major Components		Features	Location/ Extension
	Communication facilities: • Microwave communications site in Nipton • Telecommunication facilities at Eldorado Substation • Communication Room (MEER) at Ivanpah Substation	Support the SPS under specific outage contingencies, and the operation and monitoring of the substation and transmission line equipment	California: Nipton and proposed Ivanpah Substation site

Key: kV = kilovolt; SPS = Special protection system

The mitigation measures listed in Section 4.3 include the location and project component(s) in which the mitigation measure applies. In general, the mitigation measures are applicable to all project components; however, certain mitigation measures are component specific (e.g., aesthetics measures proposed for the substation location). SCE will work closely with contractor staff to ensure that site-specific mitigation measures are clearly identified.

1.2.2 Notice-to-Proceed and Approval of the Right-of-Way Grant

Project-related construction activities will not begin until preconstruction mitigation measures and submittals have been satisfied. Once preconstruction mitigation measures have been completed, SCE shall submit a request to the CPUC for a Notice-to-Proceed (NTP) for each and all phases of construction. The construction activities to be completed as part of each NTP have been determined by SCE based on the construction schedule, the anticipated schedule for permit approvals, and other considerations. The CPUC will issue an NTP for the applicable project components upon evaluation of SCE's request and confirmation that all applicable preconstruction mitigation measure requirements have been completed. The NTP may include CPUC or other agency conditions or requirements that must be satisfied prior to the start of work or during construction. Section 4.3 lists the mitigation measures, the timing for completion, applicable NTP, and whether CPUC review or approval is required before construction can commence. Table 2 shows SCE's estimated construction schedule by activity and applicable NTPs that will be required for construction to commence. In the event the BLM approves the EITP, a right-of-way (ROW) grant will be issued to SCE. SCE filed an application with the BLM for a ROW grant pursuant to the Federal Land Policy and Management Act (FLPMA). Under FLPMA Title V (Rights-of-Way), the Secretary of Interior is authorized to grant ROWs for the purpose of allowing systems for generation, transmission, and distribution of electric energy. Any grant issued by the BLM will also be subject to a NTP issued by the BLM Authorized Officer. No construction or surface disturbing activities can occur on public land until a NTP is approved. BLM NTP's may be phased to approve and recognize separate project components or phases.

Table 2: Estimated Construction Schedule by Project Component

Construction Activities	Duration (months)	Anticipated Start Date	Notice to Proceed
Substation Construction: • Ivanpah Substation • Eldorado Substation Upgrades	16	July 2011	1
Powerline Construction: • Eldorado-Ivanpah Transmission Line • Subtransmission Line • Distribution Lines	16	July 2011	2

Table 2: Estimated Construction Schedule by Project Component			
Construction Activities	**Duration (months)**	**Anticipated Start Date**	**Notice to Proceed**
IT/Telecom Construction: • Fully diverse and redundant telecommunications paths • Communication facilities	12	TBA	3

The applicant's targeted operating date is July 2013. Work activities would commence upon approval of the project by the CPUC, the BLM, and other permitting agencies. Construction is currently scheduled to commence in July 2011 and to take approximately 19 months to complete, including time for inspection and testing.

1.2.3 Project Compliance Requirements

This Plan is intended to provide pertinent information necessary to successfully implement the MMCRP during construction. The mitigation measures listed in Section 4.3 of this report are also found in Sections 3.2 through 3.14 of the Final EIR/EIS. Detailed discussions on the intent of each mitigation measure and the potential impacts that could result if the mitigation measures are not implemented properly also are provided in these sections. In addition to the Final EIR/EIS, construction activities must be conducted in accordance with the requirements stipulated in the following documents:

- Stormwater Pollution Prevention Plan (SWPPP);
- Road encroachment permits;
- Clean Water Act (CWA) Section 404 nationwide permit from the U.S. Army Corps of Engineers (USACE);
- CWA Section 401 water quality certification from the Central Valley Water Board (all Section 404 permits require a Section 401 water quality certification from the Regional Water Quality Control Board [RWQCB]);
- CWA Section 402 National Pollutant Discharge Elimination System (NPDES) permit from the State Water Board (requiring preparation of a SWPPP);
- Section 1602 Streambed Alteration Agreement and 2081 Agreement from the California Department of Fish and Game (CDFG); and
- Biological Opinion from the U.S. Fish and Wildlife Service (USFWS).

1.3 Agency Jurisdiction

In addition to the CPUC and BLM, several local, state, and federal agencies have jurisdiction over lands within the project area. The CPUC and the BLM, as joint Lead Agencies, are responsible for ensuring that mitigation measures reviewed and approved by jurisdictional agencies during the environmental review process are implemented throughout construction. However, jurisdictional agencies may visit the project site and request information regarding the status of a mitigation measure. SCE is responsible for satisfying requests from jurisdictional agencies and will notify and copy the CPUC and BLM on all correspondences related to final approvals and verifications for the project if not otherwise copied on the correspondence. Additional information on communication protocols can be found in Section 2.3. Table 3 lists contacts from jurisdictional agencies associated with the project:

Table 3: Contact Information for Agencies Consulted during the Environmental Review

Name	Title	Organization/Agency	Address	Phone Number
Air Quality				
Alan De Salvio	Supervising Air Quality Engineer	Mojave Desert Air Quality Management District	14306 Park Avenue, Victorville, CA 92392	(760) 245-1661 x6726
Biological Resources				
Michael Burroughs	Lead Tortoise Biologist	United States Fish and Wildlife Service	4701 N. Torrey Pines Drive, Las Vegas, NV 89130	(702) 515-5230
Becky Jones	Environmental Scientist	California Department of Fish and Game	36431 41st Street, East Palmdale, CA 93552	(661) 285-5867
Brad Hardenbrook	Supervisory Biologist	Nevada Department of Wildlife (Southern Region)	4747 Vegas Drive, Las Vegas, NV 89107	(702) 486-5127
Public Services and Utilities				
Michael R. Richardson	Supervisor/Compliance and Enforcement Branch	Nevada Division of Environmental Protection (Bureau of Waste Management)	2030 East Flamingo Road, Suite 230, Las Vegas, NV 89119-0818	(702) 486-2850 x227
Mark Harris	Resource Planning Engineer	Nevada Public Utilities Commission	1150 E. William Street, Carson City, NV 89701	(775) 684-6165
Clark County Desert Conservation Program				
Susan Wainscott	Adaptive Management Coordinator/Project Manager	Clark County Desert Conservation Program	333 North Rancho Drive, Suite 625 Las Vegas, NV 89106	(702) 455-3859
Land Use				
Dionicio Gordillo	Principal Planner	Clark County Department of Planning		

Table 3: Contact Information for Agencies Consulted during the Environmental Review

Name	Title	Organization/Agency	Address	Phone Number
Carrie Hyke	Supervising Planner	San Bernardino County Planning Department	385 N. Arrowhead Avenue, First Floor, San Bernardino, CA 92415-0182.	(909) 387-4147
Brok Armantrout	Director	Boulder City Community Development	City Hall, 401 California Avenue, Boulder City, NV 89005	(702) 293-9282
Transportation and Aviation				
David Kessler (AWP-610.1)	Environmental Protection Specialist	Federal Aviation Administration, Western Pacific Region, Airports Division	P.O. Box 92007, Los Angeles, CA 90009-2007	(310) 725-3615
Dan Kopulsky	Senior, Special Studies and IGR/CEQA	California Department of Transportation	464 West 4th Street, San Bernardino, CA 92401	(909) 383-4557
Teresa Motley	Airport Planning Manager	Clark County Department of Aviation	P.O. Box 11005, Las Vegas, NV 89111-1005	(702) 261-5706

2. Roles and Responsibilities

This section describes the roles and responsibilities of key project personnel with respect to the MMCRP. Figure 1 provides an organizational chart of project members responsible for implementing the MMCRP and their relationship to other staff working on the project. The organization chart also establishes preliminary lines of communication between members of the project team.

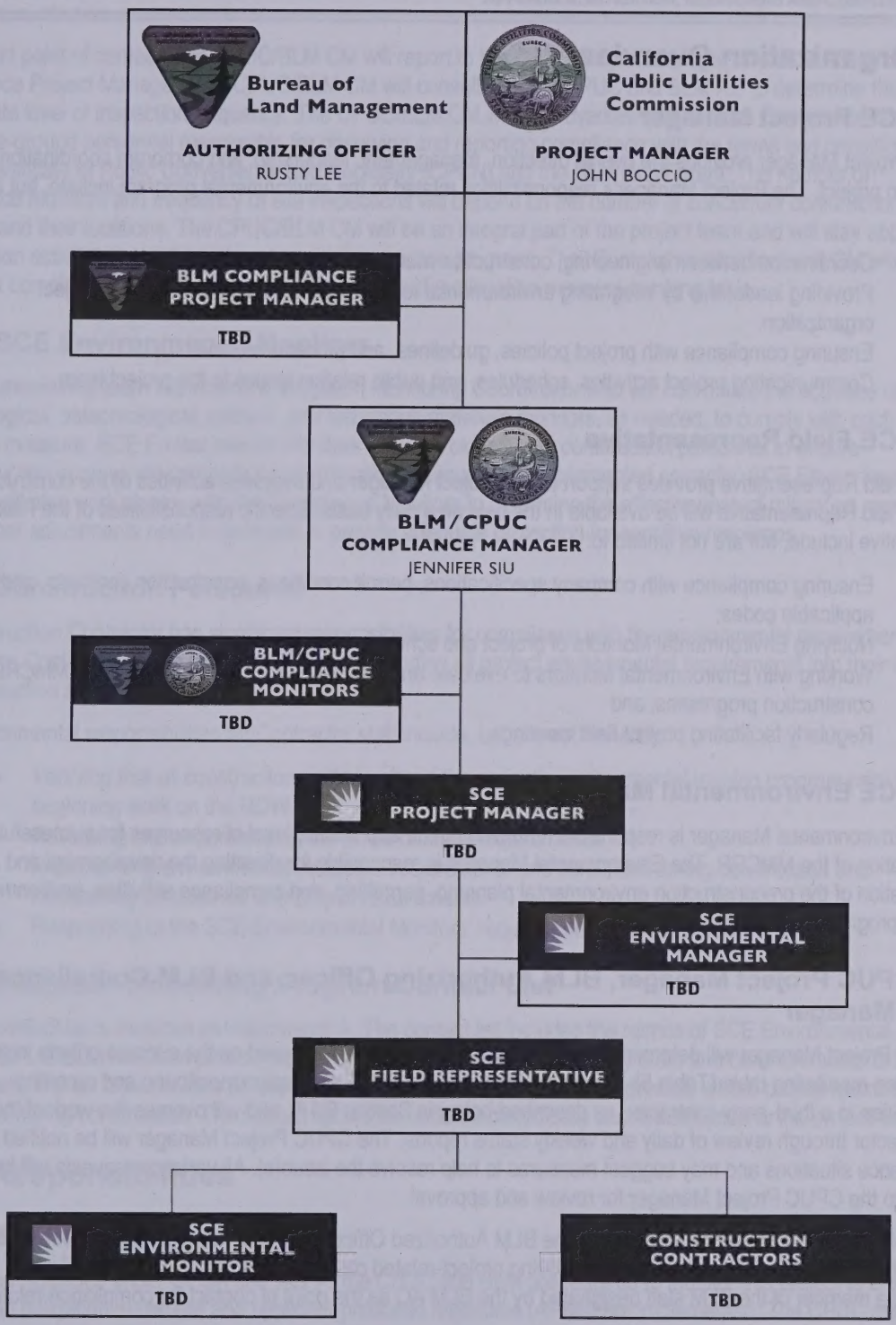

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Figure 1

Mitigation Monitoring, Compliance and Reporting Program

Eldorado – Ivanpah Transmission Project

2.1 Organization Overview

2.1.1 SCE Project Manager

The SCE Project Manager provides the overall direction, management, leadership, and corporate coordination for the construction project. The Project Manager's responsibilities related to the environmental program include, but are not limited to:

- Coordination between engineering, construction management, and environmental staff;
- Providing leadership by integrating environmental responsibilities into all levels of the project organization;
- Ensuring compliance with project policies, guidelines, and procedures; and
- Communicating project activities, schedules, and public relation issues to the project team.

2.1.2 SCE Field Representative

The SCE Field Representative provides support to the Project Manager and oversees activities of the construction staff. The Field Representative will be available in the field on a daily basis. Specific responsibilities of the Field Representative include, but are not limited to:

- Ensuring compliance with company specifications, permit conditions, construction contracts, and applicable codes;
- Notifying Environmental Monitors of project and schedule changes;
- Working with Environmental Monitors to evaluate and improve the implementation of the MMCRP, as construction progresses; and
- Regularly facilitating project field meetings.

2.1.3 SCE Environmental Manager

The SCE Environmental Manager is responsible for providing the appropriate level of resources for successful implementation of the MMCRP. The Environmental Manager is responsible for directing the development and implementation of the preconstruction environmental planning, permitting, and compliance activities, environmental inspection program, and environmental training.

2.1.4 CPUC Project Manager, BLM Authorizing Officer, and BLM Compliance Project Manager

The CPUC Project Manager will determine the effectiveness of the MMCRP based on the success criteria included in the mitigation monitoring table (Table 5). During construction, the CPUC will assign monitoring and reporting responsibilities to a third-party contractor, as described below in Section 2.1.5, and will oversee the work of the third-party contractor through review of daily and weekly status reports. The CPUC Project Manager will be notified of noncompliance situations and may suggest measures to help resolve the issue(s). All variance requests will be submitted to the CPUC Project Manager for review and approval.

The BLM Needles Field Manager will serve as the BLM Authorized Officer (AO) and has signing authority for the ROW grant and authority for accepting and approving project-related changes. The BLM Compliance Project Manager is a member of the BLM staff designated by the BLM AO as the point of contact for compliance-related issues.

2.1.5 CPUC and BLM Compliance Managers and Monitors

The CPUC and BLM will assign monitoring and reporting responsibilities to a third-party contractor that reports to the agencies. The third-party contractor designated by the CPUC and BLM to monitor compliance issues and review environmental compliance-related deliverables will assign a Compliance Manager (CPUC/BLM CM) as the

designated point of contact. The CPUC/BLM CM will report to the CPUC Project Manager, the BLM AO, and the BLM Compliance Project Manager. The CPUC/BLM CM will consult with the CPUC and BLM AO to determine the appropriate level of inspection frequency. The CPUC/BLM CM will also oversee one or more Compliance Monitors, the on-the-ground personnel responsible for observing and reporting compliance with the terms and conditions of the CPUC Certificate of Public Convenience and Necessity (CPCN) and the BLM ROW grant. The number of Compliance Monitors and frequency of site inspections will depend on the number of concurrent construction activities and their locations. The CPUC/BLM CM will be an integral part of the project team and will stay apprised of construction activities, schedule changes, and construction progress. The Compliance Monitors and CM will document compliance through weekly reports and use of a mitigation measure tracking table.

2.1.6 SCE Environmental Monitors

The SCE monitoring team will include a Mitigation Monitoring Coordinator who will coordinate the activities of the lead, biological, paleontological, cultural, and hazardous materials monitors, as needed, to comply with each mitigation measure. SCE Environmental Monitors will work closely with construction personnel to ensure preconstruction surveys are completed and mitigation measures are implemented correctly. SCE Environmental Monitors will also work closely with the Compliance Monitors to determine the effectiveness of mitigation measures and whether adjustments need to be made to provide adequate protection for sensitive resources.

2.1.7 Construction Personnel

The construction Contractor has significant responsibilities for compliance with the environmental requirements of the project. The Contractor will be responsible for incorporating all project environmental requirements into their day-to-day construction activities.

Key environmental responsibilities for Contractor staff include, but are not limited to:

- Verifying that all construction workers attend the project's environmental training program prior to beginning work on the ROW.
- Reviewing and understanding the environmental requirements.
- Implementing environmental protection requirements and conditions during construction and maintaining compliance with project requirements.
- Responding to the SCE Environmental Monitors' requests during construction.

2.1.8 Mitigation Monitoring Program Contact List

A project contact list is included as Attachment A. The contact list includes the names of SCE Environmental Monitors, CPUC/BLM CM, Compliance Monitors, project managers, supervisory staff, and other members of the project team. The list also includes phone numbers, fax numbers, and email addresses where project members can be reached during construction. The contact list will be updated periodically and redistributed to the project team.

2.2 Responsibilities

2.2.1 Monitoring

As the Lead Agencies under CEQA and NEPA, the CPUC and BLM are required to monitor this project to ensure that the required mitigation measures and applicant-proposed measures (APMs) are implemented. The CPUC and BLM will be responsible for ensuring full compliance with the provisions of this monitoring program and have primary responsibility for implementing the monitoring program. As previously mentioned, the CPUC and BLM have assigned monitoring responsibilities to a third-party monitoring program. The Compliance Monitor(s), under the supervision of the CPUC/BLM CM, will be in the field on a regular basis, particularly when construction activities have the potential to impact a sensitive resource.

Several mitigation measures require a qualified specialty monitor during construction. Table 4 provides an overview of the measures that require SCE to provide an onsite monitor.

Table 4 Specialty Monitors Required during Construction

Mitigation Measure or APM Number	Resource	Monitor	Project Components[1]
APM BIO-5	Biological Resources	Biological Monitor	All
MM BIO-10	Biological Resources	Biological Monitor	All
MM CR-1	Cultural Resources	Cultural Resources Monitor	Geotechnical studies that require trench excavation
APM PALEO-4	Paleontological Resources	Paleontological Resources Monitor	Project areas where activities would disturb previously undisturbed strata in rock units of moderate and high sensitivity; ground-disturbing activities in areas underlain by rock units of low sensitivity would be monitored on a quarter-time basis or spot-checked.

[1]See Section 1.3.2 for a description of project components.

Environmental monitors will assist construction crews with interpreting mitigation measures and correcting compliance problems in a timely manner. Environmental Monitors would also provide environmental training through the Worker Environmental Awareness Program (WEAP), as required under APM BIO-6, APM CR-2b, APM PALEO-3, and APM W-11, as new workers arrive on the project.

2.2.2 Enforcement

The CPUC and BLM are responsible for enforcing the procedures adopted for monitoring through the Compliance Monitors operating under the supervision of the CPUC/BLM CM. The Compliance Monitors shall note problems with monitoring, notify designated project members, and report the problems to the CPUC Project Manager and the BLM Compliance Project Manager.

The CPUC and BLM have the authority to halt any construction activity associated with the EITP if the activity is determined to be a deviation from the approved project or adopted mitigation measures. The CPUC and the BLM have assigned this authority to the Compliance Monitors in the field.

2.2.3 Mitigation Compliance

SCE is responsible for successfully implementing all the adopted mitigation measures listed in this MMCRP. The MMCRP contains criteria that define whether mitigation is successful. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Additional mitigation success thresholds may be imposed by applicable agencies with jurisdiction through the permitting process.

SCE shall inform the CPUC and BLM and their monitors in writing of any mitigation measures that are not or cannot be successfully implemented. The CPUC and BLM, in coordination with their monitors, will assess whether alternative mitigation is appropriate and specify to SCE the subsequent actions required.

2.3 Communication

Communication is a critical component of a successful environmental compliance program. In order to avoid project delays and possible shutdowns, environmental and construction representatives will need to interact regularly and maintain professional, responsive communications at all times. Similarly, SCE representatives will need to coordinate closely with the Compliance Monitors to address and resolve issues in a timely manner. Therefore, Section 2.3 of this MMCRP provides a communication protocol to accurately disseminate information regarding on-going surveys and mitigation measures, construction activities, contractors, and planned or upcoming work to all levels of the project. Attachment D includes a communication protocol summary to be used as a quick reference and to supplement the information provided in Section 2.3.

Preconstruction Kickoff Meeting

A preconstruction meeting will be held with the CPUC; BLM; SCE and their construction contractor; and the CPUC/BLM CM, to review the MMCRP, the terms and conditions of the BLM ROW grant, and mutually agree on the project's communication protocol.

2.3.1 Construction Progress Meetings

It is expected that SCE will conduct construction progress field meetings with construction managers, contract administrators, and environmental representatives, as needed, to ensure compliance with the MMCRP.

2.3.2 Daily Communication

Many of the problems that occur during construction can be resolved in the field through regular communication between Compliance Monitors, SCE, and construction contractors. Field staff will be equipped with cell phones and available to receive phone calls at all times during construction. A project contact list is included in Attachment A. The organization chart depicted in Section 2.0 shows the general lines of communication to be used during construction. The following provides additional guidelines to ensure effective communication in the field.

CPUC and BLM Compliance Manager and Monitors

The Compliance Monitors' primary point of contact with SCE in the field is SCE's Field Representative. The CPUC/BLM CM will contact SCE's Field Representative if an activity is observed that conflicts with one or more of the mitigation measures, so that the situation can be corrected. If the CPUC/BLM CM cannot immediately reach SCE's Field Representative, then the SCE Environmental Monitor will be contacted to address the problem. Similarly, the CPUC/BLM CM will contact SCE's Environmental Monitor for information on where construction crews are working, the status of mitigation measures, and schedule forecasts. The CPUC/BLM CM will not direct the contractor; however, the CPUC/BLM CM has the authority to stop work, assuming it is safe to do so, if an activity poses an imminent threat or puts a sensitive resource at undue risk (e.g., stopping a clearing crew from unknowingly cutting coastal sage scrub in an exclusion area).

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SCE will provide the CPUC/BLM CM with a list of construction monitoring personnel and construction supervisory staff to contact regarding compliance issues. The contact list will include each person's title, responsibility, and whether their position is segment specific. The contact list will be updated as new project personnel are assigned to the project and redistributed, as necessary.

SCE will prepare and distribute a monthly environmental compliance status report for distribution to key project members, including the CPUC and the BLM. The CPUC/BLM CM will review the monthly report to ensure that the status of mitigation measures is consistent with observations in the field. Any questions regarding the status of mitigation measures will be directed to the SCE Field Representative. The monthly environmental compliance status report will also be a tool to keep all parties informed of construction progress and schedule changes.

2.3.3 Coordination with Other Agencies

As discussed in Section 1.4, several local, state, and federal agencies have jurisdiction over portions of the land in the project area. In addition, many of the mitigation measures were derived from specific permit conditions or agency input. SCE will be responsible for contacting resource agencies and immediately notifying them of mitigation compliance issues within their jurisdiction. The CPUC/BLM CM may request copies of email correspondences, phone logs, or other documentation between SCE and resource agencies to avoid direct involvement of Compliance Monitors. However, if there is an unresolved issue regarding compliance with a mitigation measure or permit requirement under the jurisdiction of a resource agency, the Compliance Monitors may elect to contact the agency to discuss resolution. The CPUC/BLM CM will coordinate this call with SCE and provide opportunity to participate in the call.

2.3.4 Dispute Resolution

It is expected that the MMCRP will reduce or eliminate many potential disputes. However, even with the best preparation, disputes may occur. In such an event, the following procedure will be used:

Step 1. Disputes and complaints (including those of the public) should be directed to the CPUC Project Manager and the BLM Compliance Project Manager for resolution. The CPUC Project Manager and the BLM Compliance Project Manager will attempt to resolve the dispute.

Step 2. Should this informal process fail, the CPUC Project Manager and the BLM Compliance Project Manager may initiate enforcement or compliance action to address deviations from the Proposed Project or adopted Mitigation Monitoring Program.

Dispute Resolution

CPUC Process. If a dispute or complaint regarding the implementation or evaluation of the Program or the mitigation measures cannot be resolved informally or through enforcement or compliance action by the CPUC, any affected participant in the dispute or complaint may file a written "notice of dispute" with the CPUC's Executive Director. This notice should be filed in order to resolve the dispute in a timely manner, with copies concurrently served on other affected participants. Within 10 days of receipt, the Executive Director or designee(s) shall meet or confer with the filer and other affected participants for purposes of resolving the dispute. The Executive Director shall issue an Executive Resolution describing his/her decision, and serve it on the filer and other affected participants. If one or more of the affected parties is not satisfied with the decision as described in the Executive Resolution, such party(ies) may appeal it to the Commission via established appeal procedures.

BLM Process. If a dispute or complaint regarding non-compliance with the terms of the BLM ROW grant cannot be resolved informally or through enforcement or compliance action, the BLM will issue an immediate temporary suspension of the ROW or the activity. Upon issuance of the temporary suspension, SCE must stop all construction activity on the project, and the ROW holder must meet with the BLM AO to resolve the dispute or complaint of non-compliance. If a resolution is not reached through discussions with the BLM AO, BLM will terminate the ROW grant. The ROW holder may then appeal the termination of the ROW grant to the Interior Board of Land Appeals via established appeal procedures.

Involved parties may also seek review by the Commission through existing procedures specified in the Commission's Rules of Practice and Procedure for formal and expedited dispute resolution, although a good faith effort should first be made to use the foregoing procedure.

3. Environmental Compliance and Field Procedures

3.1 Mitigation Measures Compliance and Reporting

3.1.1 Compliance Verification

The Compliance Monitors will conduct routine site visits to determine compliance with the mitigation measures. Site visits may be coordinated with SCE or conducted unannounced. Supplemental information provided by SCE, including preconstruction submittals, survey reports, monthly reports, meeting notes, and agency correspondences, will also be used to verify compliance.

3.1.2 Compliance Reporting

The Compliance Monitors will document observations through the use of field notes and digital photography. In addition, field inspection forms will be utilized in the field to document compliance of specific crews, construction activities, or resource protection measures. The forms will provide a standardized checklist to facilitate inspections, as well as list mitigation measures that were verified during the site visit. Information gathered from the inspection forms and field notes will be used to generate weekly status reports and update the status of the mitigation measures listed in Section 4.3. A sample site inspection form is included in Attachment B.

3.1.3 Compliance Levels

A construction activity that deviates from permit conditions or mitigation measures, particularly when the activity puts a resource at risk, would be considered a non-compliance. In addition, a mitigation measure not implemented according to the timing restrictions listed in the mitigation table (Table 5) would be considered a non-compliance. Examples of non-compliance include, but are not limited to:

- Use of new access roads, staging areas, or extra workspaces not identified on the project drawings or approved for use during construction;
- Encroachment into an exclusion zone or sensitive resource area designated for avoidance;
- Brush clearing outside the approved work limits;
- Grading, foundation, or line work without required biological preconstruction surveys or a biological monitor onsite;
- Improper installation of erosion or sediment control structures if it puts a sensitive resource at risk; and
- Discharge of sediment-laden trench or foundation hole water into a waterbody or storm drain.

The CPUC/BLM CM will immediately notify the CPUC Project Manager, the BLM Compliance Project Manager, and the designated SCE representative of a non-compliance that requires immediate corrective action. A copy of the Compliance Monitor's Non-Compliance Report that lists actions required to bring the activity back into compliance and provides a time line for follow-up will be filed with SCE. SCE is required to contact the CPUC Project Manager and the BLM Compliance Project Manager within five working days to resolve the non-compliance. Depending on the severity of the non-compliance offense, an order to stop work or an immediate temporary suspension of the activity or ROW grant may be issued.

If a construction activity or observed resource protection measure only slightly deviates from project requirements and does not put a resource at risk, the CPUC Environmental Monitor may elect to issue an incident report to get the issue corrected. Construction activities that could result in an incident report include, but are not limited to:

- Failure to properly maintain an erosion or sediment control structure, but the structure remains functional;
- Use of an existing unapproved access road (first offense);
- Project personnel begin work without proof of training; or

- Work outside the approved work limits where the incident is within a previously disturbed area, such as a gravel lot.

Incident reports will generally not be issued twice for the same compliance issue. In other words, repeated incidences will result in a finding of non-compliance.

3.2 Project Changes

At various times throughout the project, the need for extra workspace or additional access roads may be identified. Similarly, changes to the project requirements (e.g., mitigation measures, specifications, etc.) may be needed to facilitate construction or provide more effective protection of resources. The CPUC, BLM, and SCE should work together to find solutions when variations or adjustments are necessary for specific field situations to avoid conflicts with adopted mitigation measures or specifications.

The CPUC Project Manager, BLM Compliance Project Manager, and Compliance Monitors will ensure that any variance process or deviation from the procedures identified under the monitoring program is consistent with CEQA and NEPA requirements. No project variance will be approved if it creates new significant impacts. A variance should be strictly limited to minor project changes that will not trigger other permit requirements, will not increase the severity of an impact or create a new impact, and will clearly and strictly comply with the intent of the mitigation measure.

A proposed project change that has the potential for creating significant environmental effects will be evaluated to determine whether supplemental CEQA and NEPA reviews are required. Any proposed deviation from the approved project, adopted mitigation measures, APMs, and correction of such deviation will be reported immediately to the CPUC/BLM CM for their review. The CPUC/BLM CM will review the variance request to ensure that all of the information required to process the variance has been included; they will then forward the request to the CPUC Project Manager and BLM Compliance Project Manager for review and approval. The CPUC Project Manager or the BLM Compliance Project Manager may request a site visit from the CPUC/BLM CM or need additional information to process the variance. In some cases, a variance may also require approval by jurisdictional agencies. In general, a variance request must include the following information:

- Detailed description of the location, including maps, photos, and/or other supporting documents;
- How the variance request deviates from a project requirement;
- Biological resource surveys or verification that no biological resources would be significantly impacted;
- Cultural resource surveys or verification that no cultural resources would be significantly impacted;
- Landowner approval if the location is not within SCE's ROW or property; and
- Agency approval (if necessary).

A sample variance request form is included as Attachment C.

3.3 Records Management

Inspection forms will be completed for each site visit, and weekly status reports will be filed and used by the Compliance Monitors to prepare a final environmental compliance report following the completion of construction. The final report will provide a discussion on how each mitigation measure was implemented and include copies of submittals required for compliance. In addition, the success criteria will be evaluated and used for future projects.

3.4 Public Access to Records

The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available by the CPUC for public inspection on request. In order to facilitate the public's awareness, the CPUC will make weekly reports and other pertinent project documents available on the project Web site, available at: http://www.cpuc.ca.gov/environment/info/ene/ivanpah/ivanpah.html.

4. Mitigation Monitoring Program Table

4.1 Using the Table

Section 4.3 lists the mitigation measures included in the Final EIR/EIS, the CPUC Findings, and the BLM Record of Decision (ROD). The Mitigation Monitoring Program table (Table 5) is the core document for environmental requirements on the project and will be the primary guideline for determining compliance with the MMCRP. A copy of the table should be kept with each crew working on the project, and all supervisory staff working on the project should be familiar with its contents.

The CPUC and BLM will use a modified version of the Mitigation Monitoring Program table to accurately track the status of mitigation measures. This table has an additional status column to be used by the SCE Environmental Monitors, Compliance Monitors, project managers, supervisory staff, and other members of the project team.

4.2 Effectiveness Review

The CPUC or BLM may conduct a comprehensive review of conditions that are not effectively mitigating impacts at any time it deems appropriate, including as a result of the Dispute Resolution procedure outlined in Section 2.3.5. If the Commission or the BLM determines that, based on the review, any conditions are not adequately mitigating significant environmental impacts caused by the project, then the Commission or the BLM may impose additional reasonable conditions to effectively mitigate these impacts. These reviews will be conducted in a manner consistent with the Commission's or BLM's rules and practices.

4.3 Mitigation Measures and Applicant Proposed Measures (APMs)

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
3.2 Visual Resources				
IMPACT AES-1: Adverse Impact to a Scenic Vista	**APM AES-1: Road Cut Rock Staining.** Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.	Ensure that the applicant consulted with the BLM as required in APM AES-1. See additional requirements in APM AES-1.	After construction	APM implemented.
IMPACT AES-1: Adverse Impact to a Scenic Vista	**APM AES-2: Seeding and Inter-Planting.** Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, road cuts would be treated by seeding and/or inter-planting into the disturbed areas to restore the area to an appearance that would blend back into the overall landscape context.	See requirements in APM AES-2.	After construction	Areas disturbed by EITP road construction activities restored to an appearance that blends into the surrounding landscape.
IMPACT AES-1: Adverse Impact to a Scenic Vista	**APM AES-3: Non-Reflective Finish.** LSTs and TSPs would be constructed of steel that was galvanized and treated at the factory to create a dulled finish that would reduce reflection of light off of the tower members. As appropriate to the environment, the galvanized coating would also be treated to allow the towers to blend into the backdrops. Non-specular transmission cable would be installed for the new transmission line to minimize conductor reflectivity.	See requirements in APM AES-3.	During construction	APM fully implemented as specified.
IMPACT AES-2: Degrade Existing Visual Character or Quality	**APM AES-4: Regrade / Revegetate Construction Sites.** Areas around new or rebuilt transmission and subtransmission structures that must be cleared during the construction process would be regraded and revegetated to restore them to an appearance that would blend back into the overall landscape context.	See requirements in APM AES-4.	After construction	APM fully implemented as specified.
IMPACT AES-2: Degrade Existing Visual Character or Quality	**APM AES-5: Use Existing Access Roads.** To the extent feasible, existing access roads would be used.	See requirements in APM AES-5.	During construction	APM implemented.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT AES-2: Degrade Existing Visual Character or Quality	**APM AES-6: Minimize Road Modifications.** Widening and grading of roads would be kept to the minimum required for access by proposed project construction equipment.	See requirements in APM AES-6.	During construction	APM implemented.
IMPACT AES-2: Degrade Existing Visual Character or Quality	**APM AES-7: Dust Suppression.** During the construction period, dust suppression measures would be used to minimize the creation of dust clouds potentially associated with the use of the access roads.	See requirements in APM AES-7.	During construction	APM fully implemented as specified.
IMPACT AES-2: Degrade Existing Visual Character or Quality	**MM AES-1: Painting the Ivanpah Substation.** Prior to construction, the applicant will consult with the BLM to select an appropriate color from the BLM approved palette to paint any enclosed structures that would be constructed for the Ivanpah Substation. The applicant will submit photographs following substation construction to the BLM and the CPUC to document compliance with this measure.	Ensure that BLM-approved colors were used to paint enclosed Ivanpah Substation structures and photographs of the completed structures were submitted to the BLM and CPUC.	Prior to, during, and after construction	Enclosed structures for the Ivanpah Substation are painted with colors from the BLM approved palette.
IMPACT AES-2: Degrade Existing Visual Character or Quality	**MM AES-2: Rock Staining near the Ivanpah Substation.** For areas that are cleared and/or graded to construct the Ivanpah Substation, the applicant would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.	Ensure that BLM was consulted as required in MM AES-2. See additional requirements in MM AES-2.	After construction	Rock exposed by grading for Ivanpah Substation is treated to match the overall color of adjacent weathered rock.
IMPACT AES-3: Create a New Source of Light or Glare	**APM AES-8: Substation Lighting Control.** The substation lighting would be designed to be manually operated only when required for non-routine nighttime work. The lighting would be directed downward and shielded to eliminate offsite light spill at times when the lighting might be in use.	See requirements in APM AES-8.	During and after construction	Ivanpah Substation lighting is off unless manually turned on. Lighting is directed downward and shielded.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
3.3 Air Quality and Greenhouse Gases				
IMPACT AIR-2: Temporary Ambient Air Quality Impacts Caused by Construction Activities Would Violate or Contribute Substantially to an Air Quality Violation	**MM AIR-1: Low-emission Construction Equipment.** All construction equipment with a rating between 100 and 750 horsepower (hp) will be required to use engines compliant with U.S. EPA Tier 2 non-road engine standards. In addition, all off-road and portable construction diesel engines not registered under the CARB Statewide Portable Equipment Registration Program that have a rating of 50 hp or more will meet, at a minimum, the Tier 2 California non-road engine standards unless that engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine will be equipped with a Tier 1 engine. The applicant will substitute small electric-powered equipment for diesel- and gasoline-powered construction equipment where feasible. The applicant will maintain construction equipment according to manufacturing specifications and use low-emission equipment.	Ensure that applicable equipment meets U.S. EPA standards and is registered under CARB's program as specified in MM AIR-1. See additional requirements in MM AIR-1.	During construction	Each MM AIR-1 requirement is implemented.
IMPACT AIR-2: Temporary Ambient Air Quality Impacts Caused by Construction Activities Would Violate or Contribute Substantially to an Air Quality Violation	**MM AIR-2: Enhanced Dust Control Measures.** In addition to the dust control requirements by MDAQMD and CC-DAQEM, the following measures will be implemented for mitigation: • Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area • Pre-watering of soils prior to clearing and trenching • Pre-moistening of, prior to transport, import and export dirt, sand, or loose materials • Dedication of water truck or high-capacity hose to any soil screening operations • Minimization of drop height of material through screening equipment • Reduction of the amount of disturbed area where possible • Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan as described in MM BIO-2.	Ensure that applicable MDAQMD and CC-DAQEM requirements and the additional requirements specified in MM AIR-2 are followed.	During construction	Each MM AIR-2 requirement is fully implemented.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT AIR-3: Temporary Emission Increases of NO_x, VOCs, and PM_{10} during Construction would Contribute to a Cumulatively Considerable Net Increase of a Criteria Pollutant in a Non-Attainment Area	**MM AIR-1: Low-emission Construction Equipment.** See above. **MM AIR-2: Enhanced Dust Control Measures.** See above.	See above.	See above.	See above.
IMPACT AIR-6: Generate GHG Emissions That May Have a Significant Impact on the Environment	**MM AIR-3: Best Management Practices for GHG Reduction.** The applicant would be required to enforce and follow limits for idling time for commercial vehicles, including delivery and construction vehicles. The applicant would be also be required to consider the following best management practices to reduce the potential for GHG emissions: • Joining U.S. EPA's SF6 Emission Reduction Partnership for Electric Power Systems (http://www.epa.gov/highgwp/electricpower-sf6/basic.html); • Performing annual inspections and estimation of SF6 emissions using an emission inventory protocol; • For equipment that would contain SF6, purchasing only new equipment that meets International Council on Large Electric Systems (CIGRE) standards for leak rates; • Implementing SF6 recovery and recycling; • Ensuring that only knowledgeable personnel handle SF6; and • Providing a vanpool for construction workers.	Idling time limits for commercial vehicles implemented along with best management practices for limited GHG emissions.	During construction	MM AIR-3 requirements fully implemented.
3.4 Biological Resources				
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant	**APM BIO-1: Preconstruction Surveys.** Preconstruction biological clearance surveys would be conducted by qualified biologists to identify special-status plants and wildlife.	Ensure that preconstruction biological surveys were conducted as specified in APM BIO-1.	Prior to construction	APM fully implemented as specified.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
species				
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**APM BIO-2: Minimize Vegetation Impacts.** Every effort would be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation would be flagged for avoidance.	See requirements in APM BIO-2.	Prior to and during construction	APM implemented.
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**APM BIO-4: Best Management Practices.** Crews would be directed to use Best Management Practices (BMPs) where applicable. These measures would be identified prior to construction and incorporated into the construction operations.	See requirements in APM BIO-4.	Prior to and during construction	APM implemented.
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**APM BIO-5: Biological Monitors.** Biological monitors would be assigned to the project in areas of sensitive biological resources. The monitors would be responsible for ensuring that impacts on special-status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities would need to be restricted in order to protect native plants and wildlife or special-status species. Those restricted areas would be monitored to ensure their protection during construction.	Ensure that biological monitors are assigned as specified in APM BIO-5. See additional requirements in APM BIO-5.	During construction	Biological resources in restricted areas with flagged boundaries are protected.
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**APM BIO-6: Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) would be prepared. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would include a review of the special-status species and other sensitive resources that could exist in the project area, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel would be maintained.	Ensure that all construction crews and contractors participate in WEAP training as required in APM BIO-6, and a record of training is maintained. See additional requirements in APM BIO-6.	Prior to construction	All construction crews and contractors participate in WEAP training.
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or	**APM BIO-9: Facility Siting.** Final tower and spur road locations would be adjusted to avoid sensitive biological resources to the greatest extent feasible.	See requirements in APM BIO-9.	During construction	APM implemented.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
a direct loss of habitat for listed or sensitive plant species				
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**APM AES-4: Regrade / Revegetate Construction Sites.** See above. **APM AES-6: Minimize Road Modifications.** See above. **APM AES-7: Dust Suppression.** See above.	See above.	See above.	See above.
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**MM BIO-1: Preconstruction Surveys.** Preconstruction surveys will be conducted by USFWS-approved biologists according to the most current USFWS protocols, where available by species. These surveys will include surveying brush clearing areas and ground disturbance areas within habitat deemed suitable for sensitive species by a qualified biologist. As part of the pre-construction surveys, the composition of the vegetation community will be surveyed to establish baseline conditions prior to construction for post-construction restoration efforts. These surveys will be conducted for the presence of special-status plants, the presence of noxious weeds, and the presence of general and special-status wildlife species, to prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species. For the noxious weeds survey, the level of effort and extent of the surveys will be outlined by the Invasive Plant Management Plan (MM BIO-4).	Ensure that preconstruction biological surveys were conducted as specified in MM BIO-1.	Prior to construction	Preconstruction surveys are completed.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**MM BIO-2: Reclamation Plan.** The applicant will develop a Reclamation, Restoration, and Revegetation Plan (RRRP) prior to adoption of the Final EIR/EIS that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. The RRRP will be part of the applicant's final Plan of Development for the project and should address all federal and private land disturbances, including areas where restoration activities have been funded by the Clark County MSHCP and initiated by resource agencies. The RRRP will be developed in consultation with appropriate agencies (BLM, CPUC, CDFG, and Clark County DCP) and be provided to these agencies for review and approval prior to preparation of the Final EIR/EIS. NDOW and the BLM Las Vegas Field Office will be consulted for restoration efforts concerning Nevada State protected cacti and yucca species, which may include preparation of a separate Cactus and Yucca Reclamation Plan. The RRRP will also provide details including but not limited to topsoil segregation and conservation, vegetation treatment and removal, salvage of succulent species, revegetation methods including seed mixes, rates and transplants, and criteria to monitor and evaluate revegetation success. Post-construction monitoring will be performed for 1 to 5 years, depending on the disturbance level and restoration level as outlined in the BLM's 2001 Restoration Plan for Energy Projects in the Las Vegas Field Office.	Ensure that RRRP was developed as specified in MM BIO-2 and MM BIO-3.	Prior to adoption of the Final EIR/EIS and after construction	RRRP becomes part of the Plan of Development for the proposed project and revegetation is successful as specified by the criteria outlined in the RRRP.
IMPACT BIO-1: Direct or indirect loss of listed or sensitive plant species, or a direct loss of habitat for listed or sensitive plant species	**MM BIO-3: Special-Status Plants Restoration and Compensation.** The applicant will mitigate for the loss of special-status plant species within the project area following the completion of all construction activities at a particular site and within 1 year of post-construction according to the requirements of resource agency authorizations (e.g., CDFG 2081 permit). Special-status plants will be restored by relocation of plants and/or re-seeding, replacing topsoil with existing topsoil that was removed, and re-grading to pre-existing soil contours. Measures to restore special-status plants will be implemented through the Reclamation Plan (MM BIO-2). Additionally, that plan will provide a matrix showing how the applicant will address each species considered sensitive or special-status in terms of mitigation type (e.g., seed	Ensure that mitigation for the loss of special-status plant species occurs within 1 year of construction and as specified in MM BIO-3. Ensure that documentation of consultations with agencies is provided to the CPUC.	Prior to, during, and after construction	Special-status plants are restored as specified in the RRRP or compensation is provided based on consultation with appropriate agencies.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	collection, transplanting, fencing certain population, and compensation measures). The CDFG will likely require land compensation and enhancement and endowment fees for the project in addition to restoration. If special-status plant communities cannot be restored, the applicant will provide compensation if required, in consultation with appropriate agencies (USFWS, BLM, CDFG, NDOW, and CPUC). In order to ensure enforceability, documentation of consultations with all appropriate agencies will be provided to the CPUC (the CEQA lead agency).			
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**APM BIO-1: Preconstruction Surveys.** See above. **APM BIO-4: Best Management Practices.** See above. **APM BIO-5: Biological Monitors.** See above. **APM BIO-6: Worker Environmental Awareness Program.** See above.	See above.	See above.	See above.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**APM BIO-10: Invasive Plant Management.** An invasive plant management plan would be developed to reduce the potential for spreading invasive plant species during construction activities.	Ensure that an Invasive Plant Management Plan was developed as specified in APM BIO-10.	Prior to construction	APM implemented.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**APM AES-6: Minimize Road Modifications.** See above. **APM AES-8: Substation Lighting Control.** See above. **APM NOI-4: Construction Equipment Muffled.** See below. **APM NOI-5: Construction Equipment Idling Minimized.** See below. **APM W-12: Properly Dispose of Hazardous Materials.** See below.	See above/below.	See above/below.	See above/below.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-8: Reduce Night Lighting.** Night lighting will be reduced in all natural areas to avoid unnecessary visual disturbance to wildlife. Night lighting during construction, operations, and maintenance will be reduced in natural areas using directed lighting, shielding methods, and/or reduced lumen intensity. The applicant will indicate anticipated measures to resource agencies for approval prior to construction. The approved measures will be provided to the CPUC.	Ensure that the applicant submits night lighting reduction measures to resource agencies for approval prior to construction and provides the approved measures to the CPUC. See additional requirements in MM BIO-8.	Prior to and during construction	Night lighting is reduced using directed lighting, shielding methods, reduced lumen intensity, and/or other methods.
IMPACT BIO-2: Direct or	**MM BIO-9: Cover Steep-walled Trenches or Excavations during**	Ensure that excavations are	During	Entrapment of

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**Construction**. To prevent entrapment of wildlife, all steep-walled trenches, auger holes, or other excavations will be covered at the end of each day. Fencing will be maintained around the covered excavations at night. For open trenches, earthen escape ramps will be maintained at intervals of no greater than 0.25 miles. A biological monitor will inspect all trenches, auger holes, or other excavations a minimum of twice per day during non-summer months and a minimum of three times per day during the summer (hotter) months, and also immediately prior to back-filling. Any wildlife species found will be safely removed and relocated out of harm's way, using suitable tools such as a pool net when applicable. For safety reasons, biological monitors will under no circumstance enter open excavations.	covered, earthen escape ramps are maintained for open trenches, and monitoring takes place as specified in MM BIO-9. See additional requirements in MM BIO-9.	construction	wildlife is prevented.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-10: Biological Monitors.** Biological monitors will be provided throughout construction activities in all construction zones with the potential for presence of sensitive biological resources. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use.	Ensure a minimum of one monitor per crew for crews that use heavy equipment. See additional requirements in MM BIO-10.	During construction	Biological monitors are provided for construction activities in all construction zones.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-11: Water Usage.** Water used for fugitive dust control will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.	See requirements in MM BIO-11.	During construction	Water used for fugitive dust control does not pool.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-12: Desert Tortoise Impacts Reduction Measures.** To reduce impacts on desert tortoise, the following will be done: • The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC and the Clark County Desert Conservation Program. • Construction monitoring will employ a designated field contact representative, authorized biologist(s), and qualified biologist(s)	○ Ensure acceptance of biological opinion, CDFG 2081 permit, and NDOW authorization and completion of preconstruction surveys for desert tortoise. ○ Ensure that biological monitors clear active work sites located in desert tortoise habitat each morning before construction. ○ Ensure that the results of	Prior to and during construction	Impacts on Desert Tortoise are avoided, or at minimum, active work sites are cleared of all Desert Tortoise according to the most-current applicable handling

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	approved by the USFWS, NDOW, and CDFG during the construction phase of the project. BLM will recommend qualified, authorized biologists to the USFWS and will approve all biological monitors. • Qualified and/or authorized biologists will monitor all construction activities year-round in desert tortoise habitat, regardless of the time of year or weather conditions, as tortoises are often active outside their "active" season. • Qualified and/or authorized biologists will conduct preconstruction surveys according to the most current USFWS protocol. • Authorized biologists will handle desert tortoises following the most current Desert Tortoise Council handling guidelines (2009 or newer). • Prior to commencing desert tortoise relocation activities, authorization will be obtained from NDOW, CDFG, and USFWS. The authorized biologist will not be required to receive approval to move individual desert tortoises during construction. • Desert tortoise relocations will only occur from an active construction zone to an area that is not under active construction by the EITP project or any other planned project. • Biological monitors will clear ahead of construction crews in desert tortoise habitat during all clearing and grading activities, or during any activity where undisturbed vegetation would be crushed. In addition, biological monitors will clear ahead of larger, non-rubber-tired equipment when that equipment is being driven on access and spur roads. • Biological monitors will clear all active work sites located in desert tortoise habitat each morning before construction begins and throughout the day if crews move from construction site to construction site. • Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the CFR on a weekly basis (at minimum). The authorized biologist will notify the CFR within 24 hours of any action that involves harm to a desert	biological monitoring and status of construction are detailed in daily reports submitted to the CDFG on a weekly basis. o Ensure that California-specific Desert Tortoise Council handling guidelines are followed for project activities in California. o See additional requirements in MM BIO-12.		procedures.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed. • No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95 degrees Fahrenheit (35 degrees Celsius). No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95 degrees Fahrenheit before handling or processing can be completed. If the ambient air temperature exceeds 95 degrees Fahrenheit during handling or processing, desert tortoises shall be kept shaded in an environment which does not exceed 95 degrees Fahrenheit, and the animals shall not be released until ambient air temperature declines to below 95 degrees Fahrenheit. For relocation, captured tortoises may be held overnight and moved the following morning within these temperature constraints. • During all handling procedures, desert tortoises must be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (e.g., gaping, foaming at the mouth, hyperactivity, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises must be kept shaded at all times until it is safe to release them. Ambient air temperature must be measured in the shade, protected from wind, and at a height of 2 inches above the ground surface. • If a desert tortoise voids its bladder as a result of being handled, the animal shall be rehydrated. The process of rehydrating a desert tortoise will take place at the location where the animal was captured (or to be released, for translocated tortoises), and consist of placing the desert tortoise in a tub with a clean plastic disposable liner. The amount of water that is placed in the lined tub shall not be higher than the lower jaw of the animal. Each desert tortoise shall be rehydrated for a minimum of 10 to 20 minutes. During the period			

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	when the desert tortoise is in the tub, the tub will be placed in a quiet protected area. Desert tortoises shall be soaked individually. • If a desert tortoise is injured as a result of project-related activities, it shall be immediately taken to a CDFG-approved wildlife rehabilitation or veterinary facility. The applicant shall identify the facility prior to the start of ground- or vegetation-disturbing activities. The applicant shall bear any costs associated with the care or treatment of such injured covered species. The applicant shall notify CDFG of the injury immediately unless the incident occurs outside of normal business hours. In that event CDFG shall be notified no later than noon on the next business day. Notification to CDFG shall be via telephone or email, followed by a written incident report. Notification shall include the date, time, location, and circumstances of the incident, and the name of the facility where the animal was taken. • The applicant will produce a Raven Management Plan that is acceptable to the BLM and the CPUC. Details in the plan will include information on procedures, frequency, and recommended season for conducting raven nest surveys, procedures and responsibilities for raven nest removal, USFWS/NDOW/CDFG authorization and/or permitting requirements for conducting raven control, and compensation measures for raven reduction programs in California and Nevada. The plan will be submitted to the BLM and the CPUC at least 60 days prior to construction for review and approval.			

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-13: Desert Bighorn Sheep Impacts Reduction Measures**. To reduce impacts on desert bighorn sheep, the following will be done: • Conduct preconstruction survey for desert bighorn sheep within suitable bighorn sheep habitat within 1 week prior to construction activities in the McCullough Range, Clark Mountain Range, and the southern portion of the Eldorado Valley between the Highland Range and the Southern McCullough Range. The occurrence and location of any desert bighorn sheep will be reported to NDOW for sightings in Nevada and reported to CDFG for sightings in California. • Conduct biological monitoring by a qualified biologist for desert bighorn sheep during duration of construction within suitable bighorn sheep habitat. The occurrence and location of any desert bighorn sheep will be reported to NDOW for sightings in Nevada and reported to CDFG for sightings in California. If bighorn are found to be within 500 feet of construction activities, construction in that area will be stopped until the sheep vacate the project area. • Avoid all construction activities (with the exception of vehicle use of access roads during emergencies) in lambing areas from January to May in the North McCullough Pass area (approximately MP 9 to MP 12) during the duration of construction and all maintenance events.	○ Ensure that preconstruction surveys for desert bighorn sheep are conducted no more than 1 week prior to construction and as specified in MM BIO-13. ○ Ensure that all bighorn sheep occurrences are reported to NDOW and construction is stopped if a bighorn sheep is found within 500 feet of construction activities. ○ See additional requirements in MM BIO-13.	Prior to, during, and after construction	Construction does not take place within 500 feet of any desert bighorn sheep, and construction activities in lambing areas are avoided from January to May in the North McCullough Pass area.
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-14: American Badger Impacts Reduction Measures.** To reduce impacts to American badger, the following will be done: • Qualified biologists will be notified if badgers are observed within the project area during construction activities. Work will immediately be stopped in the area if the biologists find occupied burrows within 100 feet of construction activities during preconstruction surveys. • Qualified biologists will ensure passive relocation of the occupied burrow by installing one-way trap doors on the burrow. The burrow will be collapsed after the badger vacates. • During the spring months when young may be present in burrows, burrows must be checked for young before the installation of the one-way trap door. If young are present during relocation efforts, all work will stop within 100 ft of the burrow until the young have left the	Ensure that work is stopped if occupied burrows are found within 100 feet of construction activities. See additional requirements in MM BIO-14.	Prior to and during construction	All occupied American badger burrows within 100 feet of construction activities are relocated.

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	burrows within the project area. • Work will be allowed to resume once the badger has relocated outside the 100-foot zone.			
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-15: Migratory Birds and Raptors Impacts Reduction Measures.** To reduce impacts on migratory birds and raptors, the following will be done: • Biological monitors will monitor and enforce disturbance buffers around all active bird nests (for raptors and species protected by the MBTA) found in project areas during construction. The general bird breeding season for this area is late February to early July. For raptors specifically, the applicant will use the USFWS Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (1999) to determine appropriate survey areas and disturbance buffers for active nests, except for burrowing owl nests, for which the applicant will be in compliance with the minimum distances outlined by the California Burrowing Owl Consortium Protocol. For all non-raptor bird species, biologists will survey within project areas. Because there are no standardized disturbance buffers for active non-raptor bird nests, SCE will consult with the appropriate agencies (BLM, USFWS, CDFG, and NDOW) on a case-by-case basis when active nests are found in project areas, unless directed to do otherwise by these same agencies. • Active bird nests will not be moved during breeding season, unless the project is expressly permitted to do so by the USFWS, BLM, CDFG, or NDOW depending on the location of the nest. • All active nests and disturbance or harm to active nests will be reported within 24 hours to the USFWS, BLM, CDFG, and NDOW upon detection. • The biological monitor will halt work if it is determined that active nests would be disturbed by construction activities, until further direction or approval to work is obtained from the appropriate agencies. • Seasonal work stoppages may be required by NDOW for project areas that pass the Wee Thump Joshua Tree Wilderness if	○ Ensure that the applicant consults with NDOW prior to construction. ○ Ensure that work is stopped if active nests would be disturbed by construction activities. ○ Ensure that all active nests and disturbance or harm to active nests are reported within 24 hours to the agencies specified. ○ See additional requirements in MM BIO-15.	Prior to and during construction	Work is stopped if active nests would be disturbed, and active bird nests are not moved during the breeding season unless expressly permitted.

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	construction activities occur within the breeding season. The applicant will consult with NDOW prior to construction. • As outlined by the *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006), the following avian safe practices will be employed during construction: cover phase conductors with manufactured covers, include perch discouragers on crossarms and on top of poles, exceed the minimal distance between phase conductors to prevent electrocution by perched birds and their wingspan, utilize longer horizontal insulators, suspend phase conductors on pole top and cross arms, install horizontal jumper support to increase the phase-to-ground separation, replace tension members with fiberglass or non-conducting materials, cover tension members with dielectric material, utilize fiberglass poles or switches, and install standard nest discouragers.			
IMPACT BIO-2: Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife	**MM BIO-16: Burrowing Owl Impacts Reduction Measures.** To reduce impacts on burrowing owl, the following will be done: • A qualified biologist will conduct preconstruction surveys within 30 days prior to construction for burrowing owl within suitable habitat prior to breeding season (February 1 through August 31). All areas within 50 m (approximately 150 feet) of the project area will be surveyed. • If an active nest is identified, there will be no construction activities within 50 m (approximately 150 feet) of the nest location to prevent disturbance until the chicks have fledged, as determined by a qualified biologist. • The occurrence and location of any burrowing owl will be documented by biological monitors in daily reports and submitted to the authorized biologist on a daily basis. The authorized biologist will report all incidents of disturbance or harm to burrowing owls within 24 hours to the appropriate resource agencies (USFWS, BLM, NDOW, CDFG). If burrowing owls are found on site in the California portion of the project, the following additional measures will be included: 1) As compensation for the direct loss of burrowing owl nesting and	○ Ensure that preconstruction surveys for burrowing owl are conducted within 30 days of construction and as specified in MM BIO-16. ○ Ensure that construction activities do not occur within 150 feet of active nests. ○ Ensure that all burrowing owl occurrences are reported on a daily basis to the USFWS, BLM, NDOW, and CDFG. ○ Ensure that a Burrowing Owl Mitigation and Monitoring Plan is submitted to CDFG if owls are found on site in the California portion of the project. ○ See additional requirements in MM BIO-16.	30 days prior to construction, during, and after construction	No construction activities occur within 150 feet of active nests, and for burrowing owls found on site in California, compensation is provided and the additional measures listed in MM BIO-16 are fully implemented.

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	foraging habitat, the project proponent shall mitigate by acquiring and permanently protecting known burrowing owl nesting and foraging habitat at the following ratio: (a) Replacement of occupied habitat with suitable habitat at 1.5 x 6.5 acres per pair or single bird; (b) Replacement of occupied habitat with habitat contiguous with occupied habitat at 2 x 6.5 acres per pair or single bird; and/or (c) Replacement of occupied habitat with suitable unoccupied habitat at 3 x 6.5 acres per pair or single bird. 2) A Burrowing Owl Mitigation and Monitoring Plan shall be submitted to CDFG for review and approval prior to relocation of owls. The Burrowing Owl Mitigation and Monitoring Plan shall describe proposed relocation and monitoring plans. The plan shall include the number and location of occupied burrow sites and details on adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation of artificial burrows (numbers, location, and type of burrows) shall also be included in the plan. The plan shall also describe proposed off site areas to preserve to compensate for impacts to burrowing owls/occupied burrows at the project site as required under Condition 1. A copy of the approved plan will be provided to the CPUC.			
IMPACT BIO-3: Temporary and permanent losses of native vegetation communities	**APM BIO-1: Preconstruction Surveys.** See above. **APM BIO-2: Minimize Vegetation.** See above. **APM BIO-4: Best Management Practices.** See above. **APM BIO 5: Biological Monitors.** See above. **APM BIO-6: Worker Environmental Awareness Program.** See above. **APM BIO-9: Facility Siting.** See above. **APM BIO-10: Invasive Plant Management.** See above. **MM BIO-1: Preconstruction Surveys.** See above. **MM BIO -2: Reclamation Plan.** See above. **MM BIO 3: Special Status Plants Restoration and Compensation.** See above.	See above.	See above.	See above.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT BIO-4: Introduction of invasive, non-native, or noxious plants species	**APM BIO-1: Preconstruction Surveys.** See above. **APM BIO-2: Minimize Vegetation.** See above. **APM BIO-4: Best Management Practices.** See above. **APM BIO 5: Biological Monitors.** See above. **APM BIO-6: Worker Environmental Awareness Program.** See above. **APM BIO-9: Facility Siting.** See above. **APM BIO-10: Invasive Plant Management.** See above.	See above.	See above.	See above.
IMPACT BIO-4: Introduction of invasive, non-native, or noxious plants species	**MM BIO-4: Model Invasive Plant Management Plan on the BLM Las Vegas Office DRAFT Weed Plan.** The Invasive Plant Management Plan to be developed (APM BIO-10) will be modeled on the BLM Las Vegas Office DRAFT Weed Plan. The plan will include operation and maintenance activities, as well as construction activities. The content of the plan will include results of the noxious weed inventory, identification of problem areas, preventative measures, treatment methods, agency-specific requirements, monitoring requirements, and herbicide treatment protocol. The plan will include best management practices that require that any biological material brought on-site (e.g. hay bales that may be used for controlling stormwater under APM GEO-2, and native mixes for vegetation in MM BIO-2) will be certified weed-free. The plan will be submitted to both the California and the Nevada resource agencies and to the CPUC for approval prior to construction authorization.	Ensure that an Invasive Plant Management Plan is developed as specified in MM BIO-4 and submitted to both the California and the Nevada resource agencies and to the CPUC for approval prior to construction.	Prior to construction	Invasive plant species are prevented from spreading throughout the proposed project area due to construction activities.
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	**APM BIO-2: Minimize Vegetation Impacts.** See above.	See above.	See above.	See above.
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	**APM BIO-3: Avoid Impacts on State and Federal Jurisdiction Wetlands. Avoid Impacts on State and Federal Jurisdiction Wetlands.** Construction crews would avoid impacting the streambeds and banks of streams along the route to the extent possible. As applicable, the necessary permits would be obtained from the appropriate agencies. Impacts would be mitigated based on the terms of the permits. No streams with flowing waters capable of supporting special-status species would be expected to be impacted by the	Ensure that streambeds and banks of streams are minimally impacted, and the Streambed Alteration Agreement (SAA) is followed as required by the CDFG.	During construction	APM implemented.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	proposed project.			
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	**APM BIO-4: Best Management Practices.** See above. **APM BIO-9: Facility Siting.** See above. **APM HAZ-2: Hazardous Materials and Waste Handling Management.** See below. **APM HAZ-5: SPCCP and Hazardous Materials Business Plan.** See below. **APM W-1: Avoid Stream Channels.** See below. **APM W-2: Erosion Control and Hazardous Material Plans.** See below. **APM W-4: Avoid Active Drainage Channels.** See below. **APM W-9: Prepare and Implement an Approved SWPPP.** See below.	See above/below.	See above/below.	See above/below.
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	**MM BIO-5: Jurisdictional Delineation.** Conduct a formal jurisdictional delineation within the boundaries of the project area once final engineering for the location of project-specific features is complete. This will be conducted prior to construction and is required in order to apply for permits, if needed, with USACE, California RWQCBs, and CDFG. A copy of the jurisdictional delineation will be provided to the CPUC.	Ensure that the jurisdictional delineation completed and associated permits are acquired. See additional requirements in MM BIO-5.	Prior to construction	Jurisdictional delineation is completed and associated permits are acquired.

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	**MM BIO-6: Drainage Crossings Design.** If drainages cannot be avoided by infrastructure placement, then the applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.	Ensure that drainage crossings are specifically designed to accommodate estimated peak flows and natural volume capacity throughout construction and post-construction restoration.	During and after construction	Drainage crossings accommodate peak flows and natural volume capacity throughout construction and post-construction restoration.
IMPACT BIO-5: Adverse effects on drainages, riparian areas, and wetlands	**MM BIO-7: Mitigation Monitoring Plan for Affected Jurisdictional Areas.** The applicant will develop a Mitigation Monitoring Plan for affected jurisdictional areas within established riparian areas, as needed, for submittal to the USACE for review and approval. The plan will outline measures to accomplish restoration, provide criteria for restoration success, and/or provide compensation ratios. This measure is needed to compensate for loss of waters and riparian vegetation that provide suitable habitat for special-status and sensitive species, and provide important hydrological and water quality functions in the desert environment. Monitoring and reporting, likely for up to 3 to 5 years post-construction, will be required, pending consultation with agencies. A copy of the approved Mitigation Monitoring Plan will be provided to the CPUC and CDFG.	Ensure that a Mitigation Monitoring Plan for affected jurisdictional areas is developed and submitted for approval as specified in MM BIO-7.	Prior to and after construction	Monitoring and reporting for affected jurisdictional areas within established riparian areas is conducted for up to 3 to 5 years post construction.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-4: Best Management Practices.** See above. **APM BIO-5: Biological Monitors.** See above. **APM BIO-6: Worker Environmental Awareness Program.** See above.	See above.	See above.	See above.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-7: Avoid Impacts on Active Nests.** SCE would conduct project-wide raptor and nesting bird surveys and remove trees or other vegetation, if necessary, outside of the nesting season (nesting season in the project area is late February to early July). If vegetation or existing structures containing a raptor nest or other active nest needed to be removed during the nesting season, or if work was scheduled to take place in close proximity to an active nest on an existing transmission or	Ensure that project-wide raptor and nesting bird surveys are conducted, and if trees or other vegetation are removed, they are removed outside of the nesting season as specified in APM BIO-7. See additional requirements in	Prior to and during construction	Impacts on active nests are avoided or agency coordination is completed and authorizations

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	subtransmission tower or pole, SCE would coordinate with the USFWS, CDFG, and/or the NDOW as appropriate to obtain written verification prior to moving the nest.	APM BIO-7.		obtained.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-8: Avian Protection.** All transmission and subtransmission towers and poles would be designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (APLIC 2006).	See requirements in APM BIO-8.	Prior to and during construction	APM implemented.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-9: Facility Siting.** See above.	See above.	See above.	See above.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-11: Desert Tortoise Measures.** The applicant or a qualified consultant would provide for the following to reduce impacts on desert tortoise: • The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. Additionally, compliance discussions with Clark County and Boulder City must occur prior to construction that resolve and outline the specific compensation fees or additional mitigation measures needed for loss of desert tortoise habitat. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC. • A field contact representative (FCR) would be designated and would oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The field contact representative would also oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion. • All work area boundaries associated with temporary and permanent	○ Ensure that preconstruction surveys for Desert Tortoise are conducted within 48 hours of site-specific project activities as specified in APM BIO-11. ○ Ensure that all compliance documentation is submitted as specified in APM BIO-11. Incidents considered to be in non-compliance must be immediately documented. ○ Ensure that the applicant implements a Raven Management Program. ○ Ensure that construction activities are halted in the event of injury or death to a desert tortoise or other events specified in APM BIO-11. ○ Ensure that work area boundaries associated with temporary and permanent disturbances are marked and	Prior to and during construction	See MM BIO-12.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	disturbances would be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers would strictly limit activities and vehicles to the designated work areas. • Crushing/removal of perennial vegetation in work areas would be avoided to the maximum extent practicable. • All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens. • Pets would not be allowed in working areas unless restrained in a kennel. • Where possible, motor vehicles would be limited to maintained roads and designated routes. • Vehicle speed within the project area, along ROW maintenance routes, and along existing access roads would not exceed 20 miles per hour. Speed limits would be clearly marked and all workers would be made aware of these limits. • Constructed road berms would be less than 12 inches in height and have slopes of less than 30 degrees. • Construction monitoring would employ a designated field contact representative, authorized biologist(s), and qualified biologist(s) approved by the BLM during the construction phase. At a minimum, qualified biologist(s) would be present during all activities in which encounters with tortoises could occur. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized biologist is defined as a wildlife biologist who has been authorized to handle desert tortoises by the USFWS. A field contact representative is defined as a person designated by the project proponent who is responsible for overseeing compliance with desert tortoise protective measures and for coordination with agency compliance officer(s).	crushing/removal of perennial vegetation in work areas is minimized. ○ Ensure that tortoises found on the surface are relocated to less than 1,000 feet away and handled according to the Guidelines for Handling Desert Tortoise During Construction Projects (Desert Tortoise Council 1999). See also the handling requirements specified in MM BIO-12. ○ See additional requirements in APM BIO-11.		

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	• Preconstruction clearance surveys would be conducted within 48 hours of initiation of site-specific project activities, following USFWS protocol (USFWS 1992). The goal of a clearance survey is to find all tortoises on the surface and in burrows that could be harmed by construction activities. Surveys would cover 100 percent of the acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity would be marked. Tortoise burrows would be avoided to the extent practicable, but would be excavated if they would be crushed by construction activities. • Any tortoise found on the surface would be relocated to less than 1,000 feet away. Tortoises would be handled carefully following the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises would be handled with new latex gloves each time to avoid transmission of disease, and handlers would especially note guidelines for precautions to be taken during high-temperature periods. • If a potential tortoise burrow were required to be excavated, the biologist would proceed according to the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council 1999). Tortoises removed from burrows would be relocated to an artificial burrow (Desert Tortoise Council 1999). The entrance of the artificial burrow would be blocked until construction activities in the area were over (Desert Tortoise Council 1999). • For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises might occur would be monitored by a qualified or authorized biologist. The biologist would be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The qualified or authorized biologist would watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and conduct other			

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	activities to ensure that death or injuries of tortoises were minimized. • No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) would be left unfenced or uncovered; such hazards would be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term project areas would be enclosed with tortoise-proof fencing. Fencing would be removed when restoration of the site was completed. • Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan would be documented immediately by the biological monitor. The field contact representative would ensure that appropriate corrective action was taken. Corrective actions would be documented by the monitor. The following incidents would require immediate cessation of the construction activities causing the incident, including (1) imminent threat of injury or death to a desert tortoise; (2) unauthorized handling of a desert tortoise, regardless of intent; (3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and (4) conducting any construction activity without a biological monitor where one was required. If the monitor and field contact representative did not agree, the federal agency's compliance officer would be contacted for resolution. All parties could refer the resolution to the federal agency's authorized officer. • Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed.			

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	• All construction personnel, including subcontractors, would complete a WEAP. This instruction would include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by state and federal endangered species acts. • Parked vehicles would be inspected prior to being moved. If a tortoise were found beneath a vehicle, the authorized biologist would be contacted to move the animal from harm's way, or the vehicle would not be moved until the desert tortoise left of its own accord. The authorized biologist would be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner was not exposed to temperature extremes that could be harmful to the animal. • Should any desert tortoise be injured or killed, all activities would be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist would be responsible for reporting the incident to the authorizing agencies. • A report to the USFWS would be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises would be reported. • The applicant would implement a Raven Management Program that would consist of: (1) an annual survey to identify raven nests on towers and any tortoise remains at tower locations; this information would be relayed to the BLM so that the ravens and/or their nests in these towers could be targeted for removal, (2) SCE making an annual or one time contribution to an overall raven reduction program in the California or Nevada desert, with an emphasis on raven removal in the vicinity of this project.			

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-12: Desert Bighorn Sheep Measures.** The applicant would consult with the BLM, USFWS, and NDOW regarding conservation measures to avoid impacts on desert bighorn sheep during construction. Project areas with the potential to impact bighorn sheep include the proposed transmission line route through the McCullough Range and the telecommunication route segment in the southern Eldorado Valley between the Highland Range and the Southern McCullough Range. Avoidance and minimization measures could include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn sheep active seasons. Construction requiring the use of helicopters would be conducted outside of bighorn lambing season (April through October) and the dry summer months when bighorn may need to access artificial water sources north of the propose route in the McCullough Range (June through September).	See requirements in APM BIO-12.	Prior to and during construction	See MM BIO-13.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-13: Western Burrowing Owl Measures.** Where project ground-disturbing activities would occur prior to the burrowing owl breeding season (mid-March to August), all burrows, holes, crevices, or other cavities in suitable habitat on the project, within the limits of proposed ground disturbance, would be thoroughly inspected by a qualified biologist before collapsing. This would discourage owls from breeding on the construction site. Other species using burrows would be relocated prior to collapsing burrows. If construction were to be initiated after the commencement of the breeding season and burrowing owls could be seen within areas to be affected by ground construction activities, behavioral observations would be done by a qualified biologist to determine their breeding status. If breeding were observed, the nest area would be avoided, with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the chicks fledged.	See requirements in APM BIO-13.	During construction	See MM BIO-16.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**APM BIO-14: Gila Monster and Chuckwalla Measures.** The following measures are the current NDOW construction site protocols for the Gila monster (NDOW 2005). These protocols are applicable for the Gila monster in both the Nevada and California sections of the project, and applicable for the chuckwalla in the Nevada section of the project. Through the WEAP, workers and other project personnel should (at a minimum) know how to: (1) identify Gila monsters and be able to	Ensure that all workers are trained through the Worker Environmental Awareness Program (WEAP) about Gila Monsters as specified in APM BIO-14. Ensure that Gila Monsters are handled as	Prior to and during construction	Impacts on Gila monsters are avoided or Gila Monsters are handled as specified in APM BIO-14.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	distinguish them from other lizards such as chuckwallas and banded geckos; (2) report any observations of Gila monsters (in Nevada) to the biological monitor for notification of the NDOW; (3) be alerted to the consequences of a bite resulting from carelessness or unnecessary harassment; and (4) be aware of protective measures provided under state law. • Live Gila monsters found in harm's way on the construction site would be captured and then detained in a cool, shaded environment (<85 degrees Fahrenheit) by the project biologist or equivalent personnel until a NDOW biologist can arrive for documentation purposes. Despite the fact that a Gila monster is venomous and can deliver a serious bite, its relatively slow gait allows for it to be easily coaxed or lifted into an open bucket or box, carefully using a long handled instrument such as a shovel or snake hook (note: it is not the intent of NDOW to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistical points). • A clean 5-gallon plastic bucket with a secure, vented lid; an 18-inch x 18-inch x 4-inch plastic sweater box with a secure, vented lid; or a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location (e.g., GPS record), date, time, and circumstances (e.g., biological survey or construction) and habitat description (vegetation, slope, aspect, and substrate) would also be provided to NDOW. • Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Rehabilitation or euthanasia expenses would not be covered by NDOW. However, NDOW would be immediately notified during normal business hours. If an animal is killed or found dead, the carcass would be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, habitat, and mapped location.	specified in APM BIO-14. See additional requirements in APM BIO-14.		

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	• Should NDOW's assistance be delayed, biological or equivalent acting personnel on site may be requested to remove and release the Gila monster out of harm's way. Should NDOW not be immediately available to respond for photo-documentation, a 35-mm camera or equivalent (5 mega-pixel digital minimum preferred) would be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures, preferably on slide film (.tif or .jpg digital format) would be provided to NDOW. Pictures would include the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).			
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**MM BIO-17: Gila Monster Compliance.** The most current NDOW construction site protocols for the Gila monster (NDOW 2007) will be followed by the applicant in both Nevada and California portions of the project. To reduce impacts on Gila monster, all locations of Gila monster found within the project area during surveys and construction work will be reported to NDOW and the CDFG	Ensure most current NDOW construction site protocols for the Gila monster (NDOW 2007) are followed and that all locations of Gila monster found within the project area during surveys and construction work are reported to NDOW and the CDFG.	Prior to and during construction	Impacts on Gila monsters are avoided.
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**MM BIO-18: Avian Protection Plan.** To reduce impacts on golden eagles and raptors, the applicant shall submit an Avian Protection Plan for approval to the BLM within 6 months of the issuance of any ROW grant for the project. The Plan shall be prepared according to guidance provided by the USFWS (USFWS 2010).The Avian Protection Plan must be implemented within one year from the date of any ROW grant Notice to Proceed.	Verify Avian Protection Plan prepared in accordance with MM BIO-18 submitted for approval to the BLM within 6 months of the issuance of any ROW grant for the project.	Prior to and during construction	Impacts on golden eagles and raptors are avoided.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT BIO-6: Direct or indirect loss of migratory wildlife species, corridors, or nursery sites	**MM BIO-1: Preconstruction Surveys.** See above. **MM BIO-8: Reduce Night Lighting.** See above. **MM BIO-10: Biological Monitors.** See above. **MM BIO-12: Desert Tortoise Impacts Reduction Measures.** See above. **MM BIO-13: Desert Bighorn Sheep Impacts Reduction Measures.** See above. **MM BIO-14: American Badger Impacts Reduction Measures.** See above. **MM BIO-15: Migratory Birds and Raptors Impacts Reduction Measures.** See above. **MM BIO-16: Burrowing Owl Impacts Reduction Measures.** See above.	See above.	See above.	See above.
IMPACT BIO-7: Conflict with the Provisions of local ordinances or policies	**APM BIO-2: Minimize Vegetation Impacts.** See above. **APM BIO-3: Avoid Impacts on State and Federal Jurisdiction Wetlands.** See above. **MM BIO-2: Reclamation Plan.** See above. **MM BIO-3: Special Status Plants Restoration and Compensation.** See above.	See above.	See above.	See above.
3.5 Cultural Resources and Native American Values				
IMPACT CR-1: Impacts to Cultural Resource 36-10315 (CA-SBR-10315H)	**APM CR-1: Conduct Archaeological Inventory of Areas that May Be Disturbed.** Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the proposed project. A complete cultural resources inventory of the project area has been conducted, details of which are contained in a technical report. Should the project substantially change and areas not previously inventoried for cultural resources become part of the construction plan, the applicant would ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys would be conducted and documented according to applicable laws, regulations, and professional standards.	Ensure that an archaeological inventory is conducted as specified in APM CR-1. See additional requirements in APM CR-1.	Prior to and after construction	APM fully implemented as specified.
IMPACT CR-1: Impacts	**APM CR-2: Avoid and Minimize Impacts on Significant Cultural**	See requirements in APM CR-2.	During	APM

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
to Cultural Resource36-10315 (CA-SBR-10315H)	**Resources Wherever Feasible.** Avoid and minimize impacts on significant or potentially significant cultural resources wherever feasible. To the extent practical, the applicant would avoid or minimize impacts on archaeological resources, regardless of its CRHR or NRHP eligibility status. This includes siting all ground-disturbing activities and other project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the right-of-way.		construction	implemented.
IMPACT CR-1: Impacts to Cultural Resource 36-10315 (CA-SBR-10315H)	**APM CR-3b: Evaluate Significance of Potentially Eligible Buildings and Structures.** Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation would take into account engineering, aesthetic, architectural, and other relevant attributes of each property. Buildings and structures would be evaluated for historical significance per CRHR eligibility Criteria 1, 2, and 3, and NRHP Criteria A, B, and C. A report of the evaluation of each building or structure would be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. The report would be filed with the appropriate Information Center of the California Historical Resources Information System.	Ensure that a report evaluating buildings and structures for historical significance as specified in APM CR-3b is filed with the appropriate Information Center of the California Historical Resources Information System.	Prior to construction	All historically significant buildings or structures that may be impacted are identified and evaluated as specified in APM CR-3b.
IMPACT CR-1: Impacts to Cultural Resource 36-10315 (CA-SBR-10315H)	**APM CR-4b: Implement Measures to Minimize Impacts on Significant Buildings and Structures.** Prior to construction and during construction, the applicant would implement the following measures to minimize unavoidable impacts on significant buildings and structures: • Locate proposed project facilities to minimize effects on significant buildings or structures. • If impacts on significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with the documentation standards of the National Park Service Historic American Buildings Survey/Historic American Engineering Record. • File reports and other documentation with the BLM, National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.	Ensure that reports are filed as specified in APM CR-4b. See additional requirements in APM CR-4b.	Prior to and during construction	Impacts on historically significant buildings or structures are avoided or minimized.
IMPACT CR-2: Impacts	**APM CR-1: Conduct Archaeological Inventory of Areas that May Be**	See above.	See above.	See above.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
to Previously Unidentified Cultural Resources	**Disturbed.** See above. **APM CR-2b. Conduct a Preconstruction Worker Environmental Awareness Program (see BIO-6, PALEO-3, and W-11).** The program would be presented to all proposed project personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the CRHR or NRHP. This includes construction supervisors as well as field construction personnel. No construction worker would be involved in ground-disturbing activities without having participated in the Worker Environmental Awareness Program.	Ensure that all proposed project personnel who have the potential to encounter culturally-sensitive sites including construction workers have participated in the Worker Environmental Awareness Program.	Prior to and during construction	No workers involved in ground-disturbing activities without having participated in the Worker Environmental Awareness Program
IMPACT CR-2: Impacts to Previously Unidentified Cultural Resources	**APM CR-5: Prepare and Implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan.** During construction it is possible that previously unknown archaeological or other cultural resources or human remains could be discovered. Prior to construction, the applicant would prepare a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan to be implemented if an unanticipated discovery is made. At a minimum the plan would detail the following elements: • Worker and supervisor training in the identification of cultural remains that could be found in the proposed project area, and the implications of disturbance and collection of cultural resources pursuant with the Archaeological Resources Protection Act of 1979 • Worker and supervisor response procedures to be followed in the event of an unanticipated discovery, including appropriate points of contact for professionals qualified to make decisions about the potential significance of any find • Identities of persons authorized to stop or redirect work that could affect the discovery, and their on-call contact information • Procedures for monitoring construction activities in archaeologically sensitive areas • A minimum radius around any discovery within which work would be halted until the significance of the resource has been evaluated and	Ensure that a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan is prepared and implemented as specified in APM CR-5.	Prior to and during construction	Impacts on culturally-sensitive resources are avoided or minimized.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	mitigation implemented as appropriate • Procedures for identifying and evaluating the historical significance of a discovery • Procedures for consulting Native Americans when identifying and evaluating the significance of discoveries involving Native American cultural materials • Procedures to be followed for treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans.			
IMPACT CR-2: Impacts to Previously Unidentified Cultural Resources	**APM CR-6: Inadvertent Discovery of Human Remains.** Any human remains discovered during project activities in California would be protected in accordance with current state law, specifically Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Assembly Bill 2641. If human remains determined not to be Native American are unclaimed, they would be treated under the appropriate State of Nevada statutes, including but not limited to Nevada Revised Statutes Chapter 440 and the regulations of the applicable land management agency. In the event that human remains are recovered on private lands, the landholder would have the right to designate the repository for the remains if they are determined not to be Native American or if their family affiliation cannot be determined. The provisions of the Native American Grave Protection and Repatriation Act are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains would be treated as defined in the Construction Monitoring and Unanticipated Cultural Resources Discovery Plan.	See requirements in APM CR-6.	During construction	Impacts on culturally-sensitive resources are avoided or treated in accordance with all applicable laws.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT CR-2: Impacts to Previously Unidentified Cultural Resources	**MM CR-1: Cultural Resources Monitoring.** The applicant will retain a cultural resources monitor who meets the Secretary of the Interior Standards of a Qualified Professional Archaeologist prior to commencing construction or geotechnical test trenching on the project. The archaeologist will need to be approved by the BLM and will provide construction monitoring for any geotechnical studies that require trench excavation. As mentioned in APM GEO-1, five of the tower installations and 20 percent of the ground-trenching activities are in archaeologically sensitive areas. Monitoring in these areas will be determined by the BLM prior to construction. Monitoring is necessary because a potential for cultural resources beneath desert pavement surfaces on alluvial planes was recently determined. Such conditions exist throughout much of the EITP project area. This monitoring effort would be used to protect potential resources and to provide data to help confirm or deny the theory of desert pavement development that would allow for buried cultural resources. BLM reserves the right to increase the amount of monitoring at any time if conditions reveal the necessity. The archaeologist will present to the BLM for approval, no less than 60 days prior to commencement of construction, a monitoring plan; copies of which will also be submitted to the CPUC by the archaeologist. The archaeologist will also provide a report of findings after the monitoring has been completed. Because this geoarchaeological sensitivity has not been widely tested, the BLM is requiring only a small sample of monitoring at this time; further monitoring will only be required if the need is proven.	Ensure that the cultural resources monitoring plan is presented to the BLM for approval no less than 60 days prior to commencement of construction and a copy is sent to the CPUC. See additional requirements in MM CR-1.	Prior to and during construction	Impacts on culturally-sensitive resources are avoided or minimized.
IMPACT CR-2: Impacts to Previously Unidentified Cultural Resources	**MM CR-3: Archaeological Resources Protection Act (ARPA) Training.** Prior to construction, the applicant will provide ARPA training with the preconstruction Worker Environmental Awareness Program (WEAP; APM CR-2b). As required for the WEAP, ARPA training will be presented to all proposed project personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the NRHP. This includes construction supervisors as well as field construction personnel. No construction worker would be involved in	Ensure that all proposed project personnel who have the potential to encounter culturally-sensitive sites including construction workers have participated in ARPA training.	Prior to and during construction	No workers involved in ground-disturbing activities without having participated in the ARPA training.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	ground-disturbing activities without having participated in the ARPA training portion of the WEAP.			
IMPACT CR-3: Unanticipated Discovery of Human Remains	**APM CR-6: Inadvertent Discovery of Human Remains.** See above.	See above.	See above.	See above.
Removal of portions of historic resources (NEPA Only Impact).	**MM CR-2: Historic American Engineering Record Recordation**. Prior to construction of the EITP, the applicant will retain a cultural resources specialist qualified to conduct HAER recordation, meeting the Secretary of the Interior Standards. The qualified cultural resources specialist will conduct HAER recordation on Cultural Resource 36-10315 (CA-SBR-10315H) HAER recordation will be conducted in accordance the Secretary of the Interior's Standards for Architectural and Engineering Documentation, following Documentation Criteria Level II, as appropriate, for the level of significance assigned to the resources.	See requirements in MM CR-2.	Prior to and during construction	Cultural resources specialist qualified to conduct HAER recordation, Standards retained by SCE. Resources documented according to HAER level 2 standards
3.6 Geology, Soils, Minerals, and Paleontology				
IMPACT GEO-1: Rupture of Earthquake Fault Across the Transmission Line Route	**APM GEO-1: Geotechnical Engineering and Engineering Geology Study.** Prior to final design of substation facilities and transmission and subtransmission line tower foundations, a combined geotechnical engineering and engineering geology study would be conducted to identify site-specific geologic conditions and potential geologic hazards in sufficient detail to support sound engineering practices.	Ensure that a Geotechnical Engineering and Engineering Geology Study is completed.	Prior to construction	See MM GEO-2.
IMPACT GEO-2: Exposure of People or Structures to Potential Adverse Effects Due to Seismic Ground Shaking	**APM GEO-1: Geotechnical Engineering and Engineering Geology Study.** See above.	See above.	See above.	See above.

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Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT GEO-2: Exposure of People or Structures to Potential Adverse Effects Due to Seismic Ground Shaking	**APM GEO-2: Recommended Practices for Seismic Design of Substations.** For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronics Engineers (IEEE) Standards Association Standard 693, "Recommended Practices for Seismic Design of Substations," which includes probabilistic earthquake hazard analysis. Other project elements would be designed and constructed in accordance with the appropriate industry standards, as well as good engineering and construction practices and methods.	See requirements in APM GEO-2.	Prior to and during construction	APM fully implemented as specified.
IMPACT GEO-3: Exposure of People or Structures to Potential Adverse Effects Due to Seismic-Related Ground Failure	**APM GEO-1: Geotechnical Engineering and Engineering Geology Study.** See above. **APM GEO-2: Recommended Practices for Seismic Design of Substations.** See above.	See above.	See above.	See above.
IMPACT GEO-4: Exposure of People or Structures to Adverse Effects Due to Landslides	**APM GEO-1: Geotechnical Engineering and Engineering Geology Study.** See above.	See above.	See above.	See above.
IMPACT GEO-4: Exposure of People or Structures to Adverse Effects Due to Landslides	**MM GEO-1: Monitor and Mitigate Damage to Tower Structures.** SCE will contact the California Department of Water Resources and the Nevada Division of Water Resources on an annual basis to determine if groundwater withdrawals pose a potential for threatening to cause ground subsidence within the project area. If physical evidence proves groundwater withdrawals are threatening tower locations, SCE will develop a plan, following their operations and maintenance policies, to mitigate potential damage to tower structures using standard foundation remediation techniques available.	Ensure that a plan to mitigate damage to tower structures due to subsidence is developed if physical evidence proves groundwater withdrawals are threatening tower locations. See additional requirements in MM GEO-1.	During and after construction (annually)	Damage to tower structures is avoided.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT GEO-5: Erosion of Soil at Towers and the Substation and Along Access Roads	**APM GEO-3: Project Construction Stormwater Pollution Prevention Plan Protection Measures Regarding Soil Erosion / Water Quality.** Transmission line and substation construction activities would be conducted in accordance with the soil erosion/water quality protection measures to be specified in the project construction stormwater pollution prevention plan (SWPPP). New access roads would be designed to minimize ground disturbance from grading. They would follow natural ground contours as closely as possible, and would include specific features for road drainage. Measures could include water bars, drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings would be constructed, they would be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.	See requirements in APM GEO-3.	During construction	See MM GEO-3.
IMPACT GEO-5: Erosion of Soil at Towers and the Substation and Along Access Roads	**MM GEO-2: Geotechnical Engineering Study.** The applicant will prepare a geotechnical engineering study prior to the final project design to identify site-specific geological conditions and potential geologic hazards. The data collected from the study will be used to guide sound engineering practices and to mitigate potential geologic hazards.	Ensure that a Geotechnical Engineering Study is completed and the results applied as specified in MM GEO-2.	Prior to and during construction	Potential geologic hazards are identified and engineering practices modified accordingly.
IMPACT GEO-6: Structural Failure of Towers and Substation Facility Due to Unstable Soil Conditions Resulting in Subsidence or Collapse	**APM GEO-1: Geotechnical Engineering and Engineering Geology Study.** See above. **APM GEO-2: Recommended Practices for Seismic Design of Substations.** See above. **MM GEO-1: Monitor and Mitigate Damage to Tower Structures.** See above.	See above.	See above.	See above.
IMPACT GEO-6: Structural Failure of Towers and Substation Facility Due to Unstable Soil Conditions Resulting in Subsidence or Collapse	**MM GEO-3: Preparation and Implementation of SWPPP.** The applicant will prepare a SWPPP for review and approval by the Lahontan Regional Water Quality Control Board (Region 6) and the Clark County Stormwater Quality Management Committee that addresses construction and post-construction project-related ground disturbances and associated erosion. The plan will provide the necessary engineering controls and procedures to minimize impact to the ground surface caused by construction, operation, and maintenance activities. A copy of	Ensure that a SWPPP is prepared and approved as specified in MM GEO-3.	Prior to, during, and after construction	Impacts to ground surfaces caused by construction, operation, and maintenance activities are minimized.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	the approved plan will also be submitted to the CPUC.			
IMPACT GEO-7: Structural Failure of Towers of Substation Facility Due to Expansive Soils	**APM GEO-1: Geotechnical Engineering and Engineering Geology Study.** See above.	See above.	See above.	See above.
IMPACT GEO-7: Structural Failure of Towers of Substation Facility Due to Expansive Soils	**MM GEO-4: Expansive Soils Mitigation.** The applicant will prepare a geotechnical study of the areas of expansive soil(s) identified in APM GEO-1 to develop appropriate design and mitigation measures prior to construction.	Ensure that the geotechnical study is completed and the results applied as specified in MM GEO-4.	Prior to construction	Potential hazards due to expansive soils are identified and engineering practices modified accordingly.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-1: Retention of Paleontologist and Preparation of a Paleontological Resource Management Plan.** Prior to construction, a certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a Paleontological Resource Management Plan (PRMP) for the proposed project. This PRMP would be prepared and implemented under the direction of the paleontologist and would address and incorporate APMs PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine whether fossils are present. The monitor would have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens. More specific guidelines for paleontological resource monitoring could be found in the PRMP.	Ensure that a PRMP is prepared and implemented as specified in APM PALEO-1. See additional requirements in APM PALEO-1.	Prior to and during construction	Impacts on paleontological resources are avoided or paleontological resources are recovered and preserved.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-2: Pre-construction Paleontological Field Survey.** The paleontologist and/or his or her designated representative would conduct a pre-construction field survey of the project area underlain by Tertiary rock units and older alluvium. Results of the field inventory and associated recommendations would be incorporated into the PRMP.	Ensure that a preconstruction paleontological field survey is completed and the results incorporated into the PRMP as specified in APM PALEO-2.	Prior to construction	Impacts on paleontological resources are avoided or paleontological resources are recovered and

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
				preserved.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-3: Worker Environmental Awareness Program (see BIO-6, CR-2b, W-11).** A Worker Environmental Awareness Program would be provided to construction supervisors and crew for awareness of requirements regarding the protection of paleontological resources and procedures to be implemented in the event fossil remains are encountered by ground-disturbing activities.	Ensure that the WEAP includes paleontological resources training as specified in APM PALEO-3.	Prior to construction	Impacts on paleontological resources are avoided or paleontological resources are recovered and preserved.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-4: Construction Monitoring.** Ground-disturbing activities would be monitored on a part-time or full-time basis by a paleontological construction monitor only in those parts of the project area where these activities would disturb previously undisturbed strata in rock units of moderate and high sensitivity. Quaternary alluvium, colluvium, and Quaternary landslide deposits have a low paleontological sensitivity level and would be spot-checked on a periodic basis to ensure that older underlying sediments were not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities had reached a depth 5 feet below the present ground surface and fine-grained strata were present. Ground-disturbing activities in areas underlain by rock units of low sensitivity would be monitored on a quarter-time basis or spot-checked if fine grained strata were present.	See requirements in APM PALEO-4.	During construction	Impacts on paleontological resources are avoided or paleontological resources are recovered and preserved.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-5: Recovery and Testing.** If fossils were encountered during construction, construction activities would be temporarily diverted from the discovery and the monitor would notify all concerned parties and collect matrix for testing and processing as directed by the project paleontologist. In order to expedite removal of fossil-bearing matrix, the monitor may request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction would resume at the discovery location once the necessary matrix was stockpiled, as determined by the paleontological monitor. Testing of stockpiles would consist of screen washing small samples to determine if important fossils were present. If such fossils were present, the additional matrix from the stockpiles would be water screened to ensure recovery of a scientifically significant sample.	Ensure that construction activities are halted if fossils are encountered. See additional requirements in APM PALEO-5.	During construction	Impacts on paleontological resources are avoided or paleontological resources are recovered and preserved.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	Samples collected would be limited to a maximum of 6,000 pounds per locality.			
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-6: Monthly Progress Reports.** The project paleontologist would document interim results of the construction monitoring program with monthly progress reports. Additionally, at each fossil locality, field data forms would record the locality, stratigraphic columns would be measured, and appropriate scientific samples would be submitted for analysis.	Ensure that monthly progress reports are completed. See additional requirements in APM PALEO-6.	During construction	Impacts on paleontological resources are avoided or paleontological resources are recovered and preserved.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-7: Analysis of and Preparation of Final Paleontological Resource Recovery Report.** The project paleontologist would direct identification, laboratory processing, cataloging, analysis, and documentation of the fossil collections. When appropriate, and in consultation with SCE, splits of rock or sediment samples would be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. After analysis, the collections would be prepared for curation (see APM PALEO-8). A final technical report would be prepared to summarize construction monitoring and present the results of the fossil recovery program. The report would be prepared in accordance with SCE, Society of Vertebrate Paleontology guidelines, and lead agency requirements. The final report would be submitted to SCE, the lead agency, and the curation repository.	Ensure that a Final Paleontological Resource Recovery Report is prepared and submitted as specified in APM PALEO-7.	During construction	APM fully implemented as specified.
IMPACT PALEO-1: Direct of Indirect Damage or Destruction of Paleontological Resources	**APM PALEO-8: Curation.** Prior to construction, SCE would enter into a formal agreement with a recognized museum repository, and would curate the fossil collections, appropriate field and laboratory documentation, and final Paleontological Resource Recovery Report in a timely manner following construction.	See requirements in APM PALEO-8.	Prior to construction	Paleontological resources, if encountered, are recovered and preserved.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
3.7 Hazards, Health, and Safety				
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	**APM HAZ-2: Hazardous Materials and Waste Handling Management.** Hazardous materials used and stored on-site for the proposed construction activities, as well as hazardous wastes generated on-site as a result of the proposed construction activities, would be managed according to the specifications outlined below as follows: • **Hazardous Materials and Hazardous Waste Handling Program:** A Project-specific hazardous materials management and hazardous waste management program would be developed prior to initiation of the Project. The program would outline proper hazardous materials use, storage and disposal requirements, as well as hazardous waste management procedures. The program would identify types of hazardous materials to be used during the Project and the types of wastes that would be generated. All Project personnel would be provided with Project-specific training. This program would be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes would be handled and disposed of according to applicable rules and regulations. Employees handling wastes would receive hazardous materials training and shall be trained in: hazardous waste procedures; spill contingencies; waste minimization procedures; and TSDF training in accordance with OSHA Hazard Communication Standard and 22 CCR. SCE would use landfill facilities that are authorized to accept treated wood pole waste in accordance with HSC 25143.1.4(b). • **Construction Stormwater Pollution Prevention Plan:** A Project-specific construction SWPPP would be prepared and implemented prior to the start of construction of the transmission line and substations. The SWPPP would use BMPs to address the storage and handling of hazardous materials and sediment runoff during construction activities (California Stormwater Quality Association 2004). • **Transport of Hazardous Materials:** Hazardous materials that	Ensure that a Hazardous Materials and Waste Handling Management Plan is prepared and implemented as specified in APM HAZ-2.	Prior to, during, and after construction and during operations	The plan is implemented and impacts from hazardous materials are avoided or minimized.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	would be transported by truck include fuel (diesel fuel and gasoline), and oil and lubricants for equipment. Containers used to store hazardous materials would be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used would be established in accordance with USDOT, CalTrans, and NDOT regulations. A qualified transporter would be selected to comply with federal and state transportation regulations. • **Fueling and Maintenance of Construction Equipment:** Written procedures for fueling and maintenance of construction equipment would be prepared prior to construction. Vehicles and equipment would be refueled on-site or by tanker trucks. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations would be located in designated areas where absorbent pads and trays would be available. The fuel tanks would also contain a lined area to ensure that accidental spillage does not occur. Drip pans or other collection devices would be placed under the equipment at night to capture drips or spills. Equipment would be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants would be kept in an approved locker or storage cabinet. • **Fueling and Maintenance of Helicopters:** Written procedures for fueling and maintenance of helicopters would be prepared prior to construction. Helicopters would be refueled at helicopter staging areas or local airports. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling areas would be located in designated areas where absorbent pads and trays are available. • **Emergency Release Response Procedures:** An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would			

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, would be immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain if the spill impacted any sensitive area, including conservation areas and wildlife preserved, or if the spill causes injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.			
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	**APM HAZ-5: Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan.** **Spill Prevention, Countermeasure, and Control Plan.** In accordance with Title 40 of the CFR, Part 112, SCE would prepare a SPCC Plan for proposed and/or expanded substations. The plans would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup. **Hazardous Materials Business Plans.** Prior to operation of new or expanded substations, SCE would prepare or update and submit, in accordance with Chapter 6.95 of the CHSD, and Title 22 CCR, a HMBP. The required documentation would be submitted to the designated CUPA in California. (An HMBP or similar documentation is not required by the state of Nevada.) The HMBPs would include hazardous materials and hazardous waste management procedures, and emergency response procedures including emergency spill cleanup supplies and equipment.	Ensure that a Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan are prepared and implemented as specified in APM HAZ-5.	Prior to, during, and after construction and during operations	The plans are implemented and impacts from hazardous materials are avoided or minimized.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	**MM HAZ-1: Worker Health and Safety and Environmental Training and Monitoring Program.** Prior to construction, the applicant will conduct a worker safety and environmental training program. As part of the program, the applicant will develop and implement a Health and Safety Plan. The Health and Safety Plan should address all potential situations that workers could encounter during construction and maintenance, including safety issues that may be unique to any of the alternatives. The Health and Safety Plan, at minimum, must require that first aid kits be stored in each construction vehicle and that a worker trained in first aid be included in each work group. The purpose and goal of the worker safety and environmental training will be to communicate project-related environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and BMPs, to all field and construction personnel prior to the start of construction. Training will also encompass environmental training related to road designations, speed limits, and restrictions on camping within the surrounding Boulder City Conservation Easement to ensure compatibility with neighboring land uses, promote "good neighbor" policies, and institute best management practices for construction. SCE will also conduct health and safety training for Operation and Maintenance activities.	Ensure that a Worker Health and Safety and Environmental Training and Monitoring Program is prepared and implemented as specified in MM HAZ-1.	Prior to and during construction and during operations and maintenance	Project-related environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and BMPs, are communicated to all field and construction personnel.
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	**MM HAZ-4: Disposal of Demolition Materials.** All debris generated during project-related demolition of structures, buildings, asphalt, or concrete-paved surface areas must be tested for the presence of hazardous chemicals, mercury, asbestos, and any other materials that may be deemed hazardous before disposal. The applicant will ensure that the materials are properly disposed of depending on the sampling results.	Ensure that all debris specified in MM HAZ-4 is tested and properly disposed of depending on the sampling results in compliance with MM HAZ-4.	Prior to and during construction and during operations and maintenance	Proper testing and disposal in full compliance with MM HAZ-4
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	**MM HAZ-5: Backfill Material.** If backfill material is used, it will be sampled and determined to be contaminant-free before it is used to fill excavations.	Ensure that any backfill material used is sampled and determined to be contaminant-free before use.	Prior to and during construction and during operations and maintenance	No contaminated backfill material is used for the project.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HAZ-1: Create Hazards through Routine Transport, Use, or Disposal of Hazardous Materials	**MM HAZ-6: EPA Identification Number.** If it is determined that hazardous waste will be generated during construction, the applicant will obtain an EPA Identification Number before construction begins. Before construction begins, the applicant will also determine whether the treatment or the handling or the storing of hazardous materials will require authorization of the local Certified Unified Program Agency (CUPA). If necessary, the applicant must receive authorization from the local CUPA before construction begins.	Ensure that an EPA Identification Number is obtained before construction begins if it is determined that hazardous waste will be generated during construction. Also, ensure CUPA authorization is obtained if deemed necessary.	Prior to construction.	EPA Identification Number/ CUPA authorization possessed by SCE, as required for hazardous materials, prior to construction.
IMPACT HAZ-2: Create Hazards through Accidental Release of Hazardous Materials into the Environment	**APM PUSVC-1: Work Around High Pressure Pipelines.** See below. **APM PUSVC-2: Monitoring by Pipeline Companies.** See below. **APM HAZ-2: Hazardous Materials and Waste Handling Management.** See above. **MM HAZ-1: Worker Health and Safety and Environmental Training and Monitoring Program.** See above. **MM HAZ-4: Disposal of Demolition Materials.** See above. **MM HAZ-5: Backfill Material.** See above. **MM HAZ-6: EPA Identification Number.** See above.	See above/below.	See above/below.	See above/below.
IMPACT HAZ-2: Create Hazards through Accidental Release of Hazardous Materials into the Environment	**APM HAZ-3: Soil Management Plan.** A Soil Management Plan would be developed and implemented for construction of the proposed project. The objective of the Soil Management Plan is to provide guidance for the proper handling, on-site management, and disposal of impacted soil that might be encountered during construction activities. The plan would include practices that are consistent with the California Title 8, OSHA regulations, as well as appropriate remediation standards that are protective of the planned use. Appropriately trained professionals would be on-site during preparation, grading, and related earthwork activities to monitor soil conditions encountered. The Soil Management Plan would provide guidelines for the following: • Identifying impacted soil • Assessing impacted soil • Soil excavation	Ensure that a Soil Management Plan is prepared and implemented as specified in APM HAZ-3.	Prior to construction	APM fully implemented as specified.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	• Impacted soil storage • Verification sampling • Impacted soil characterization and disposal In the event that potentially contaminated soils were encountered within the footprint of construction, soils would be tested and stockpiled. In California, the CUPA would determine whether further assessment is warranted. In Nevada, the NDEP BCA Spill Hotline (888-331- 6337) would be contacted if the quantity of impacted material is greater than 3 cubic yards.			
IMPACT HAZ-3: Expose the Public or Environment to Contaminated Soil or Groundwater	**APM HAZ-1: Phase I Environmental Site Assessment.** A Phase I Environmental Site Assessment would be performed at each new or expanded substation location and along newly acquired transmission or subtransmission line ROWs. The Phase I Environmental Site Assessment would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to a company which specializes in this type of work and who would produce a comprehensive report (Report) for the new or expanded ROW. The Report is used to identify sites located on federal, state, and local government agency databases which may have the potential to impact the proposed project. The Report would be reviewed and, based on such review, any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I Environmental Site Assessment which is compliant with ASTM 1927-05 (ASTM 2005) would be performed on all property to be acquired. Based on the results of the Phase I Environmental Site Assessment, additional assessment, characterization, and remediation of potential or known subsurface impacts may be conducted prior to construction activities. Such remediation could include the relocation of transmission line structures as necessary to avoid impacted areas, or the removal and disposal of impacted soils and/or groundwater according to applicable regulations.	Ensure that a Phase I ESA was conducted as specified in APM HAZ-1.	Prior to construction	Contaminated sites with the potential to impact the proposed project are identified and addressed as specified in APM HAZ-1.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HAZ-3: Expose the Public or Environment to Contaminated Soil or Groundwater	**MM HAZ-3: Agency Coordination and Approvals.** Before initiating the Phase I Environmental Site Assessment, site investigation under the Soil Management Plan, and/or any remediation work, the applicant will develop and submit a work plan to the appropriate federal, state, and local regulatory authority to oversee hazardous waste investigations or cleanups. No work will begin without approval of the appropriate regulatory authorities. The applicant will submit results of all analytical reports to the appropriate regulatory authorities in a report that summarizes the sampling results in reference to regulatory standards. The applicant will submit all closure certification or remediation approval reports to the appropriate regulatory authorities. **MM HAZ-5: Backfill Material.** See above.	See requirements in MM HAZ-3.	Prior to Phase I Environmental Site Assessment, Prior to construction	Compliance with MM HAZ-3
IMPACT HAZ-4: Increase Safety Hazards for People Residing or Working Within Two Miles of a Public Airport or Public Use Airport	**APM LU-1: Aeronautical Considerations.** See below.	See below.	See below.	See below.
IMPACT HAZ-4: Increase Safety Hazards for People Residing or Working Within Two Miles of a Public Airport or Public Use Airport	**MM HAZ-2: Comply with FAA Requirements Upon Construction of the SNSA.** The applicant will comply with all FAA requirements upon construction of the SNSA.	Meet FAA requirements upon construction of the SNSA.	Prior to construction of the SNSA.	Design of the proposed project follows all FAA requirements and takes into consideration all FAA recommendations.
IMPACT HAZ-5: Impair Implementation of or Physically Interfere with an Adopted Emergency Response Plan or Emergency Evacuation Plan	**APM TRA-1: Obtain Permits.** See below. **APM TRA-2: Traffic Management and Control Plans.** See below.	See below.	See below.	See below.
IMPACT HAZ-6: Expose	**APM HAZ-4: Fire Management Plan.** The Fire Management Plan	Ensure that a Fire Management	Prior to and	APM

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
People or Structures to Wildland Fires	developed by SCE and presented in this PEA as Appendix K would be implemented (National Fire Association 1994).	Plan is implemented.	during construction	implemented.
3.8 Hydrology and Water Quality				
IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater	**APM W-2: Erosion Control and Hazardous Material Plans.** Erosion control and hazardous material plans would be incorporated into the construction bidding specifications to ensure compliance.	See requirements in APM W-2.	Prior to construction	Erosion control and hazardous material plans are incorporated into construction bidding specifications.
IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater	**APM W-10: Emergency Release Response Procedures.** The Emergency Release Response Procedures developed pursuant to APM HAZ-1 would be maintained onsite (or in vehicles) during construction of the proposed project.	See requirements in APM W-10.	During construction	Emergency Release Response Procedures are maintained onsite (or in vehicles) during construction.
IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater	**APM W-12: Properly Dispose of Hazardous Materials.** All construction and demolition waste, including trash and litter, garbage, and other solid waste, would be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials would be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.	See requirements in APM W-12.	During construction	All waste is disposed of properly.
IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater	**APM W-13: Identify Location of Underground Utilities Prior to Excavation.** Prior to excavation, the applicant or its contractors would locate overhead and underground utility lines, such as natural gas, electricity, sewage, telephone, fuel, and water lines, or other underground structures that may reasonably be expected to be encountered during excavation work.	See requirements in APM W-13.	Prior to construction	All existing overhead and underground utility lines that may be encountered are identified.
IMPACT HYDRO-1: Introduction of Hazardous	**MM W-1: Erosion Control Plan and Compliance with Water Quality Permits.** The applicant will employ a professional engineer to develop	Ensure that an Erosion Control Plan is developed and	Prior to and during	Erosion Control Plan is

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
Contamination into Surface and Groundwater	and implement an Erosion Control Plan and monitor construction activities to ensure compliance with federal and state water quality permits. The Erosion Control Plan will comply with or exceed BMPs commonly used on projects in the California/Nevada area and those outlined in county plans. Copies of the Erosion Control Plan will be submitted to CPUC. MM W-1 will also serve to strengthen APMs W-1, W-4, and W-5 to include all intermittent and ephemeral streams and desert washes as depicted on USGS and NHD mapping and those identified during the applicant's field reconnaissance surveys. The intent of this MM is to minimize the impact of construction on surface water quality in the basins surrounding the proposed project. This MM will apply to all construction sites for the duration of construction and restoration activities.	implemented as specified in MM W-1.	construction	developed and implemented to minimize the impact of construction on surface water quality and compliance with federal and state water quality permits is maintained.
IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater	MM W-6: DESCP, SWPPP, and Grading and Storm Water Management Plan for Ivanpah Substation. The applicant will be required to submit copies of the approved Drainage, Erosion, and Sediment Control Plan (DESCP) and Storm Water Pollution Prevention Plan (SWPPP) to CPUC three months prior to the start of construction, and implement those plans as part of the EITP.	Ensure that DESCP, SWPPP, and Grading and Storm Water Management Plans for Ivanpah Substation are developed and implemented as specified in MM W-6.	Prior to and during construction	DESCP, SWPPP, and Grading and Storm Water Management Plans are developed and implemented to minimize the impact of construction on surface water quality at the Ivanpah Substation.
IMPACT HYDRO-2: Lowering of Water Table or Interference with Aquifer Recharge	**APM W-1: Avoid Stream Channels.** Construction equipment would be kept out of flowing stream channels.	See requirements in APM W-1.	Prior to and during construction	APM fully implemented as specified.
IMPACT HYDRO-2: Lowering of Water Table or Interference with	**APM W-6: Collect and Divert Runoff.** Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes.	See requirements in APM W-6.	During construction	APM fully implemented as specified.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
Aquifer Recharge				
IMPACT HYDRO-2: Lowering of Water Table or Interference with Aquifer Recharge	**APM W-7: Ditch and Drainage Design.** Ditches and drainage devices would be designed to handle the concentrated runoff and located to avoid disturbed areas. They would have energy dissipations at discharge points that might include rip-rap, concrete aprons, and stepped spillways. Where diversion dikes are required to protect towers or other project structures from flooding or erosion, these dikes would be designed to avoid increasing the risk of erosion or flooding onto adjacent property.	Ensure that ditches and drainage devices are be designed to handle the concentrated runoff and located to avoid disturbed areas. Ensure that diversion dikes are designed to avoid increasing the risk of erosion or flooding onto adjacent property.	Prior to and during construction	APM fully implemented as specified.
IMPACT HYDRO-2: Lowering of Water Table or Interference with Aquifer Recharge	**MM W-2: Water Use Maximum.** The applicant has estimated using a maximum of between 32,000 and 40,000 gpd of water for the construction phase of the project. This translates to between 30.6 and 38.3 acre-ft/yr. The applicant has stated that no water would be used during the operational phase of the project. Under MM W-2, the applicant will limit construction phase water use to a maximum of 45 acre feet per annum. The applicant will not use water during the operational phase of the project. Emergency water uses, including fire suppression, are excluded from these maxima. If the applicant requires additional water for construction or operation of the project, the applicant must submit a request to the CPUC and the BLM.	Ensure that a Water Use Plan is developed and implemented as specified in MM W-2.	Prior to and during construction	Water Use Plan is developed, approved, and implemented and water use for project activities does not exceed the maximum volumes specified in the plan.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	**APM W-3: Project Design Features.** See above. **APM W-4: Avoid Active Drainage Channels.** See above.	See above.	See above.	See above.
IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	**APM W-5: Diversion Dikes.** Diversion dikes would be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) could not be avoided; and (b) where there is a very significant flood scour/deposition threat, unless such diversion is specifically exempted by the CPUC and/or the BLM Authorized Officer.	See requirements in APM W-5.	During construction and operations	Diversion dikes, where required by APM W-5, divert runoff around tower structures.
IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	**APM W-6: Collect and Divert Runoff.** Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes	See requirements in APM W-6.	During construction	Runoff from roadways is collected and diverted from unstable slopes.
IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	**APM W-7: Ditch and Drainage Design.** Ditches and drainage devices would be designed to handle the concentrated runoff and located to avoid disturbed areas. They would have energy dissipations at discharge points that might include rip-rap, concrete aprons, and stepped spillways. Where diversion dikes are required to protect towers or other project structures from flooding or erosion, these dikes would be designed to avoid increasing the risk of erosion or flooding onto adjacent property.	See requirements in APM W-7.	During construction	Ditches and drainage devices are designed as specified in APM W-7.
IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	**APM W-8: Minimize Cut and Fill Slopes.** Cut and fill slopes would be minimized by a combination of benching and following natural topography where possible.	See requirements in APM W-8.	During construction	The amount of cut and fill slopes is minimized.
IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns	**MM W-1: Erosion Control Plan and Compliance with Water Quality Permits.** See above.	See above.	See above.	See above.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HYDRO-4: Altered Course of Stream or River due to Modification of Surface Drainage Patterns	**APM W-1: Avoid Stream Channels.** Construction equipment would be kept out of flowing stream channels.	See requirements in APM W-1.	During construction	Construction equipment is kept out of flowing stream channels.
IMPACT HYDRO-4: Altered Course of Stream or River due to Modification of Surface Drainage Patterns	**APM W-4: Avoid Active Drainage Channels.** See above.	See above.	See above.	See above.
IMPACT HYDRO-4: Altered Course of Stream or River due to Modification of Surface Drainage Patterns	**MM W-3: Onsite Flow Model and Channel System.** The applicant will employ a hydrologist to develop an Onsite Flow Model to predict any alteration in flow path that would result from construction and operation and maintenance of the proposed project. The applicant will also develop a channel system to prevent erosion and to mitigate altered flow paths. The Onsite Flow Model and channel system design will be submitted to the CPUC for review at least three months prior to the start of construction. The intent of this MM is to ensure that stormwater runoff will not cause flooding. The applicant will monitor the channel system throughout construction to assess effectiveness and ensure compliance with the designed system. Additionally, the applicant will coordinate with BLM and CPUC on model parameters and assumptions used in modeling.	Ensure that an Onsite Flow Model is developed and used as specified in MM W-3.	Prior to and during construction	Stormwater runoff does not cause flooding.
IMPACT HYDRO-4: Altered Course of Stream or River due to Modification of Surface Drainage Patterns	**MM W-4: Dry Lake Restoration Plan.** The applicant will employ a hydrologist and a restoration specialist to develop a Restoration Plan for disturbance of dry lake beds. The proposed project would cross through Ivanpah Lake. Construction would disturb the flat dry lake bed surface that is used for recreation. The intent of this MM is to ensure that the dry lake bed is restored to preconstruction conditions. The BLM will review the plan prior to the start of construction. The BLM would also assess the success of the restoration and determine whether the Ivanpah Lake surface had been restored to preconstruction conditions. In addition, the applicant will coordinate with the BLM the submission of the plan to the CDFG for CDFG review. The applicant will provide the CPUC with a copy of the Restoration Plan.	Ensure that a Dry Lake Restoration Plan is developed and used as specified in MM W-4.	Prior to and during construction	Dry lake beds impacted by the proposed project are restored to preconstruction conditions.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HYDRO-5: Modified Runoff Characteristics That Exceed Existing Stormwater Systems, Possibly leading to Flooding or Inundation by Mudflow	**APM W-5: Diversion Dikes.** See above. **APM W-6: Collect and Divert Runoff.** See above. **APM W-7: Ditch and Drainage Design.** See above.	See above.	See above.	See above.
IMPACT HYDRO-5: Modified Runoff Characteristics That Exceed Existing Stormwater Systems, Possibly leading to Flooding or Inundation by Mudflow	**MM W-5: Historical Hydrological Model of Alluvial Fan.** In the PEA, the applicant completed a historical hydrological model on site area alluvial fan(s) based on similar work on alluvial fans performed near Laughlin, Nevada (House 2005). The applicant extrapolated the data by applying the methodology from the Laughlin area model to the California portion of the project area. This study will be used to determine the active and inactive portions of the alluvial fans in the site area relative to surface water, sediment transport, and flash flooding. Where feasible, the applicant will locate towers, substations, and other permanent site features on inactive portions of the alluvial fan to minimize risk associated with flash flooding and alluvial fan failure.	See requirements in MM W-5.	Prior to construction	Mitigation measure implemented as specified.
IMPACT HYDRO-6: Substantially Degrade Water Quality	**APM W-2: Erosion Control and Hazardous Material Plans.** See above. **APM W-4: Avoid Active Drainage Channels.** See above.	See above.	See above.	See above.
IMPACT HYDRO-6: Substantially Degrade Water Quality	**APM W-9: Prepare and Implement an Approved SWPPP.** As a part of the SWPPP, soil disturbance at tower construction sites and access roads would be the minimum necessary for construction and designed to prevent long-term erosion through the following activities: restoration of disturbed soil, re-vegetation, and/or construction of permanent erosion control structures. BMPs in the project SWPPP would be implemented during construction to minimize the risk of an accidental release.	Ensure that a SWPPP approved and implemented as specified in APM W-9.	Prior to and during construction	APM fully implemented as specified.
IMPACT HYDRO-6: Substantially Degrade Water Quality	**MM W-1: Erosion Control Plan and Compliance with Water Quality Permits.** See above. **MM W-3: Onsite Flow Model and Channel System.** See above.	See above.	See above.	See above.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT HYDRO-7: Placement of Structures within a 100-year Flood Hazard Area	**APM W-3: Project Design Features.** See above. **APM W-5: Diversion Dikes.** See above.	See above.	See above.	See above.
IMPACT HYDRO-8: Exposure to a Significant Risk of Flooding	**APM W-1: Avoid Stream Channels.** See above. **APM W-4: Avoid Active Drainage Channels.** See above. **APM W-5: Diversion Dikes.** See above. **APM W-7: Ditch and Drainage Design.** See above. **MM W-5: Historical Hydrological Model of Alluvial Fan.** See above.	See above.	See above.	See above.
IMPACT HYDRO-9: Modify runoff Characteristics, Possibly Leading to Flooding or Inundation by Mudflow	**APM W-1: Avoid Stream Channels.** See above. **APM W-4: Avoid Active Drainage Channels.** See above. **APM W-5: Diversion Dikes.** See above. **APM W-7: Ditch and Drainage Design.** See above. **MM W-5: Historical Hydrological Model of Alluvial Fan.** See above.	See above.	See above.	See above.
3.9 Land Use				
IMPACT LU-1: Conflict with applicable Plans and Policies	**APM LU-1: Aeronautical Considerations.** The applicant would submit notice to FAA electronically, in accordance with FAA procedures, and as far in advance of construction as possible.	See requirements in APM LU-1.	Prior to construction	APM implemented.
IMPACT LU-1: Conflict with applicable Plans and Policies	**MM LU-1: Obtain Approval from Clark County and the City of Boulder City for Activities Outside of BLM-Designated Utility Corridors in the BCCE.** Prior to construction, the applicant must consult with and obtain permission from Clark County and the City of Boulder City regarding construction outside of BLM-designated utility corridors in the BCCE. In addition, the applicant will comply with all land use restrictions, such as speed limits, in consultation with the BCCE, and will fully comply with the Amendment to the Interlocal Agreement, including Exhibit D. The applicant will submit a record of this consultation to the BLM and the CPUC prior to construction.	Ensure that the applicant consults with Clark County and Boulder City for activities outside of BLM-designated utility corridors in the Boulder City Conservation Easement (BCCE) as specified in MM LU-1.	Prior to construction	Mitigation measure fully implemented.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT LU-1: Conflict with applicable Plans and Policies	**MM HAZ-2: Comply with FAA Requirements Upon Construction of the SNSA.** See above.	See above.	See above.	See above.
3.10 Noise				
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	**APM NOI-1: Compliance with Local Noise Ordinances.** The proposed construction would comply with local noise ordinances. There may be a need to work outside the aforementioned local ordinances to take advantage of low electrical draw periods during the nighttime hours. The applicant would comply with variance procedures requested by local authorities if required.	See requirements in APM NOI-1.	During construction	APM fully implemented as specified.
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	**APM NOI-2: Construction Equipment Working Order.** Construction equipment would be in good working order.	See requirements in APM NOI-2.	During construction	Construction equipment is in good working order.
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	**APM NOI-3: Construction Equipment Maintenance.** Construction equipment would be maintained per manufacturer's recommendations.	See requirements in APM NOI-3.	During construction	Construction equipment is maintained per manufacturer recommendations.
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	**APM NOI-4: Construction Equipment Muffled.** Construction equipment would be adequately muffled.	See requirements in APM NOI-4.	During construction	Construction equipment is muffled.
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	**APM NOI-5: Construction Equipment Idling Minimized.** Idling of construction equipment and vehicles would be minimized during the construction.	See requirements in APM NOI-5.	During construction	See MM NOI-3.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
IMPACT NOI-1: Project construction noise exceeding noise levels or standards	**MM NOI-1: Conduct Construction Activities during Daytime Hours.** The applicant will conduct construction activities only during daytime hours (7 a.m. to 7 p.m.) while in the vicinity of the Desert Oasis Apartment Complex.	See requirements in MM NOI-1.	During construction	Complaints about construction activities from residents of the Desert Oasis Apartment Complex are minimized.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	**APM NOI-2: Construction Equipment Working Order.** See above. **APM NOI-3: Construction Equipment Maintenance.** See above. **APM NOI-4: Construction Equipment Muffled.** See above. **APM NOI-5: Construction Equipment Idling Minimized.** See above.	See above.	See above.	See above.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	**APM NOI-6: Hearing Protection for Workers.** Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan.	See requirements in APM NOI-6.	During construction	APM implemented.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	**MM NOI-1: Conduct Construction Activities during Daytime Hours.** See above.	See above.	See above.	See above.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	**MM NOI-2: Relocate Stationary Construction Equipment.** The applicant will locate stationary construction equipment at a site location that is as far away from the Desert Oasis Apartment Complex as is feasible.	See requirements in MM NOI-2.	During construction	Complaints about construction activities from residents of the Desert Oasis Apartment Complex are minimized.
IMPACT NOI-5: Cause a	**MM NOI-3: Turn off Idling Equipment.** The applicant will turn off idling	See requirements in MM NOI-3.	During	Construction

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
substantial temporary increase in ambient noise levels in the project vicinity	equipment when not in use.		construction	equipment and vehicles are not allowed to idle when not in use.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	**MM NOI-4: Notify Adjacent Residences.** The applicant will notify residents within 200 feet of the transmission line in advance of construction work.	See requirements in MM NOI-4.	Prior to construction	Residents within 200 feet of the transmission line are notified in advance of construction work.
IMPACT NOI-5: Cause a substantial temporary increase in ambient noise levels in the project vicinity	**MM NOI-5: Install Acoustic Barriers.** The applicant will install acoustic barriers around stationary construction noise sources near sensitive receptors.	See requirements in MM NOI-5.	During construction	Stationary construction noise reduction is achieved near sensitive receptors.
3.11 Public Services and Utilities				
IMPACT PUSVC-1: Emergency services needed in response to an accident or other emergency incident associated with the proposed project	**APM HAZ-4: Fire Management.** See above. **APM TRA-2: Traffic Management and Control Plans.** See below. **APM TRA-3: Minimize Street Use.** See below.	See above/below.	See above/below.	See above/below.
IMPACT PUSVC-1: Emergency services needed in response to an accident or other emergency incident associated with the proposed project	**APM PUSVC-1: Work Around High Pressure Pipelines.** No mechanical equipment will be permitted to operate within 3 feet of the high-pressure pipelines, and work within 3 feet must be done by hand or as otherwise directed by the pipeline company.	See requirements in APM PUSVC-1.	During construction	Existing pipelines are not damaged during construction of the proposed project.
IMPACT PUSVC-1: Emergency services	**APM PUSVC-2: Monitoring by Pipeline Companies.** A representative of applicable owners and operators of major pipeline companies must	See requirements in APM	During	Existing pipelines are not

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
needed in response to an accident or other emergency incident associated with the proposed project	observe the excavation around or near their facilities to ensure protection and to record pertinent data necessary for operations.	PUSVC-2.	construction	damaged during construction of the proposed project.
IMPACT PUSVC-1: Emergency services needed in response to an accident or other emergency incident associated with the proposed project	**MM HAZ-1: Worker Health and Safety and Environmental Training and Monitoring Program.** See above.	See above.	See above.	See above.
NEPA IMPACT: Result in a major reduction or interruption of existing utility systems by crossing or sharing a location with another utility.	**MM PUSVC-2: Notification of Utility Service Interruption.** If a utility service interruption is known to be unavoidable, the applicant will notify by postal mail members of the public, the jurisdiction, and the service providers who would be affected. The applicant will also publish notices in newspapers circulated in each jurisdiction that would be affected. The postal mail and newspaper notices will specify the estimated duration of each service interruption and be mailed or published no later than seven days prior to the first interruption. Copies of the notices will be provided to the BLM and CPUC no later than 30 days following notification.	See requirements in MM PUSVC-2.	Prior to and during construction	Mitigation measure is fully implemented as specified.
IMPACT PUSVC-2: Project construction temporarily increases water use, and project operation contributes to increased long-term water consumption	**MM W-2: Water Use Plan.** See above.	See above.	See above.	See above.
IMPACT PUSVC-2: Project construction temporarily increases water use, and project operation contributes to increased long-term	**MM PUSVC-1: Construction Waste Disposal Plan.** The applicant will prepare a Construction Waste Disposal Plan for all nonhazardous wastes generated during construction of the proposed project and submit the plan to the BLM and the CPUC for review and approval no less than 30 days prior to start of construction. The plan will contain the following, at a minimum:	Ensure that a Construction Waste Disposal Plan is prepared and implemented as specified in MM PUSVC-1.	30 days prior to and during construction	Nonhazardous waste is recycled or salvaged to the maximum extent possible.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
water consumption	• Description of all nonhazardous solid and liquid construction wastes, including: – Estimated amounts to be disposed of in a landfill by weight or volume and – Estimated amounts that can be recycled or salvage by weight or volume; • Recycling, salvage, and waste minimization/source reduction plans; • Management methods to be used for each type of waste, including temporary on-site storage, housekeeping and best management practices to be employed, and methods of transportation and packaging; and • Description and list of all contracts and plans made with waste contractors, landfills, and wastewater treatment facilities. The applicant may refer to internal salvage and waste manuals in the Construction Waste Management Plan where applicable. The plan is necessary to ensure that solid waste is recycled or salvaged to the maximum extent possible. In addition, the applicant would need to observe the Nevada Legislature's goal to recycle 25 percent of total solid waste generated within each municipality of Nevada.			
IMPACT PUSVC-3: Solid waste generated during construction of the project exceeds landfill requirements	**MM PUSVC-1: Construction Waste Disposal Plan.** See above.	See above.	See above.	See above.
IMPACT PUSVC-4: Solid waste generated during construction of the project results in noncompliance with federal, state, or local statutes, regulations, or policies	**MM PUSVC-1: Construction Waste Disposal Plan.** See above.	See above.	See above.	See above.
3.12 Recreation				
IMPACT REC-1:	**APM REC-1: Recreation Area Closures.** When temporary short-term	See requirements in APM REC-1.	Prior to	APM fully

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
Disruption of Access to Existing Recreation Opportunities	closures to recreational areas are necessary for construction activities, the applicant would coordinate those closures with recreational facility owners. To the extent practicable, the applicant would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). The applicant would post notice of the closure on-site 14 calendar days prior to the closure.		construction	implemented as specified.
IMPACT REC-1: Disruption of Access to Existing Recreation Opportunities	**MM REC-1: Limit Construction Workspace in Wildlife and Recreational Areas.** The applicant will not site extra workspace areas such as contractor yards in Recreation Areas to minimize impacts on recreational users during construction. In addition, the applicant will coordinate with the BLM, as well as organizers of BLM-permitted races and events in the project area, to ensure that project construction will not interrupt events.	See requirements in MM REC-1.	During construction	The applicant does not site extra workspace areas such as contractor yards in recreation areas.
IMPACT REC-1: Disruption of Access to Existing Recreation Opportunities	**MM REC-2: Notify the Nevada Department of Wildlife of Any Road Closures During Hunting Season.** To allow access for hunters in the area, the applicant will not close the southern right-of-way of the McCullough Pass during construction. The applicant will notify NDOW of any road closures during hunting season at least 30 days prior to closure.	Verify NDOW has been notified.	Prior to and during construction.	NDOW notified of road closures in advance. Southern right-of-way of the McCullough Pass not closed during construction.
Clarification of roads available for OHV usage (NEPA Only Impact).	**MM REC-3: Display Appropriate "Closed" Signage for New Spur Roads Constructed in Nevada.** The applicant will coordinate with BLM Field Offices on displaying appropriate "closed" signage at the entrance to new spur roads to tower locations and access roads. This includes temporary signs during the construction phase of the project and permanent signs and/or vehicle barriers that will close the spur routes to public travel.	Ensure posting of "closed" signage for project spur roads located in Nevada.	Prior to, during, and after construction.	Claity for OHV users that spur roads in NV are closed.
3.13 Socioeconomics, Population and Housing, and Environmental Justice				
No impact	No applicable APMs or mitigation measures			

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
3.14 Traffic and Transportation				
IMPACT TRANS-1: Traffic Load and Capacity	**APM TRA-2: Traffic Management and Control Plans.** Traffic control and other management plans will be prepared where necessary to minimize project impacts on local streets and railroad operations.	See requirements in APM TRA-2.	Prior to and during construction	Project impacts on local streets and railroad operations are minimized.
IMPACT TRANS-2: Impact Level of Service Standard and Lane Closures	**APM TRA-1: Obtain Permits.** If any work requires modifications or activities within local roadway and railroad ROWs, appropriate permits will be obtained prior to the commencement of construction activities, including any necessary local permits and encroachment permits.	See requirements in APM TRA-1.	Prior to construction	APM implemented.
IMPACT TRANS-2: Impact Level of Service Standard and Lane Closures	**AMP TRA-2: Traffic Management and Control Plans.** See above.	See above.	See above.	See above.
IMPACT TRANS-2: Impact Level of Service Standard and Lane Closures	**APM TRA-3: Minimize Street Use.** Construction activities will be designed to minimize work on, or use of, local streets.	See requirements in APM TRA-3.	During construction	Street use for construction activities is minimized.
IMPACT TRANS-2: Impact Level of Service Standard and Lane Closures	**MM TRANS-1: No Lane Closures on I-15 during Friday Peak Usage.** The applicant will limit construction activities on Friday afternoon from noon to 10 p.m. so as not to require lane closures on I-15.	Ensure that construction activities do not occur on Friday afternoon from noon to 10 p.m. to avoid lane closures on I-15.	During construction	No lane closures occur on I-15 due to project activities.
IMPACT TRANS-2: Impact Level of Service Standard and Lane Closures	**MM TRANS-3: Traffic Control Plan.** Prior to start of construction of the EITP, the applicant will prepare and implement a Traffic Control Plan for the project to address staggering of deliveries on I-15 during peak traffic times.	Ensure that a Traffic Control Plan is prepared and implemented as specified in MM TRANS-2	Prior to and during construction	Deliveries staggered on I-15 during peak traffic times in accordance with theTraffic Control Plan.
IMPACT TRANS-4: Result in a Change in Air Traffic Patterns	**MM TRANS-2: Helicopter Flight Plan and Safety Plan.** At least 30 days prior to construction of the project, the applicant will coordinate with the FAA for review and approval of any helicopter flight plans that would take place during construction and operation. The applicant will then	Ensure that a Helicopter Flight Plan and Safety Plan is developed and implemented and helicopter use information is	30 days prior to construction	Mitigation measure fully implemented as specified.

Table 5 Mitigation Monitoring Plan

Type of Impact	Applicant Proposed Measures (APMs) and Mitigation Measures (MMs)	Monitoring Requirements	Timing	Determination of Effectiveness
	provide information to the BLM and the CPUC regarding the intended need and use of helicopters during construction and operation of the project, including the flight and safety plan; the number of days and hours that the helicopter would operate; the type and number of helicopters that would be used; the location, size, and number of staging areas for helicopter take off and landing; and written approval from property owners for use of helicopter staging areas. The applicant will review the helicopter flight and safety plan with the FAA and the CCDOA at least 30 days prior to the start of SNSA construction and resubmit the revised plan to the BLM and the CPUC.	provided to the BLM and CPUC as specified in MM TRANS-2. Ensure that if construction of the Southern Nevada Supplemental Airport (SNSA) is approved, the applicant consults with the FAA at least 30 days prior to the start of SNSA construction and revises the Helicopter Flight Plan and Safety Plan as necessary.		
Cumulative Impact TRANS-C-1: *Traffic Load, Capacity, and Level of Service*	**MM-C-TRANS-1: I-15 Use Limits.** MM-C-TRANS-1 will require the applicant to limit the use of I-15 on Fridays from noon to 10 p.m. This will require using alternative routes or planning sufficiently such that vehicular use of I-15 would be limited to fewer than 15 vehicles every 15 minutes, resulting in a minor, short-term cumulative impact. Implementation of this mitigation measure would reduce the EITP's incremental contribution to less than significant or minor. EITP construction would result in short-term adverse traffic impacts where vehicles and equipment would enter or leave construction yards and at crossing points along the transmission line route. Crossing points which are in and near Primm, were considered for this cumulative analysis. However, these effects, even when combined with the existing traffic in Primm and the reasonably foreseeable future projects that would be located in and near Primm (DesertXpress Rail Line, Calnev Pipeline Expansion, First Solar, and Silver State), are so localized and temporary that they would not measurably change the existing conditions; therefore, no cumulative impacts on ground traffic would occur.	See requirements in MM-C-TRANS-1.	Prior to and during construction	Limited use of I-15 on Fridays from noon to 10 p.m accordance with MM-C-TRANS-1

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Appendix 5
Location Maps and Figures

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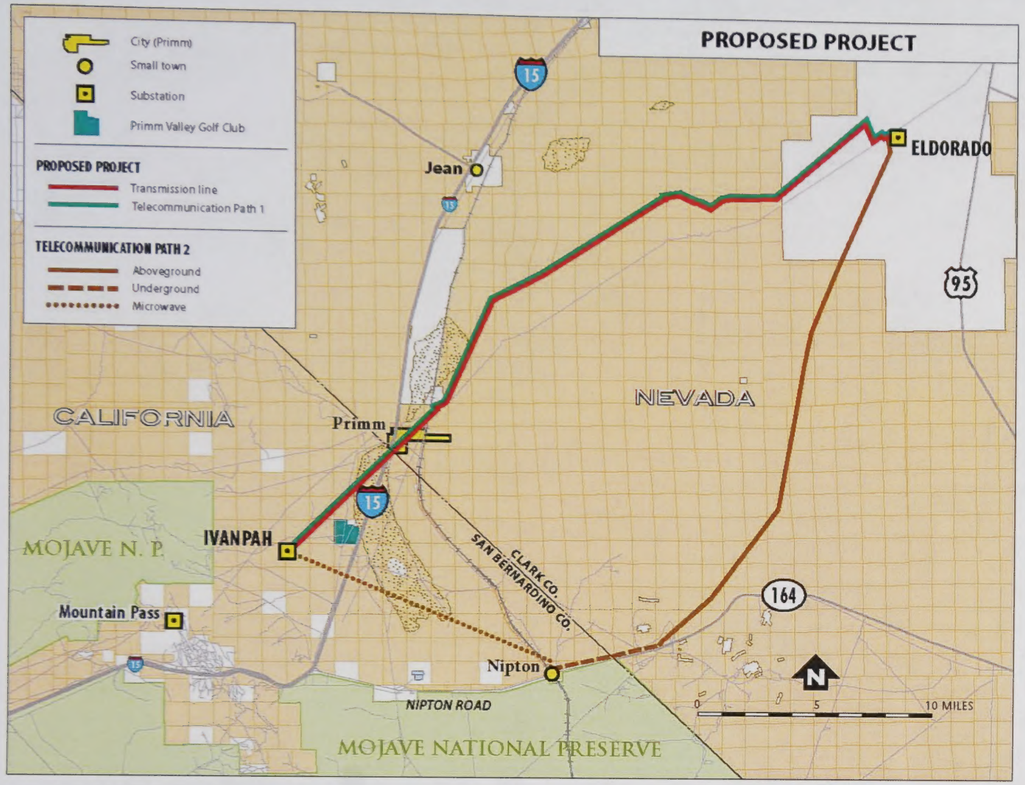

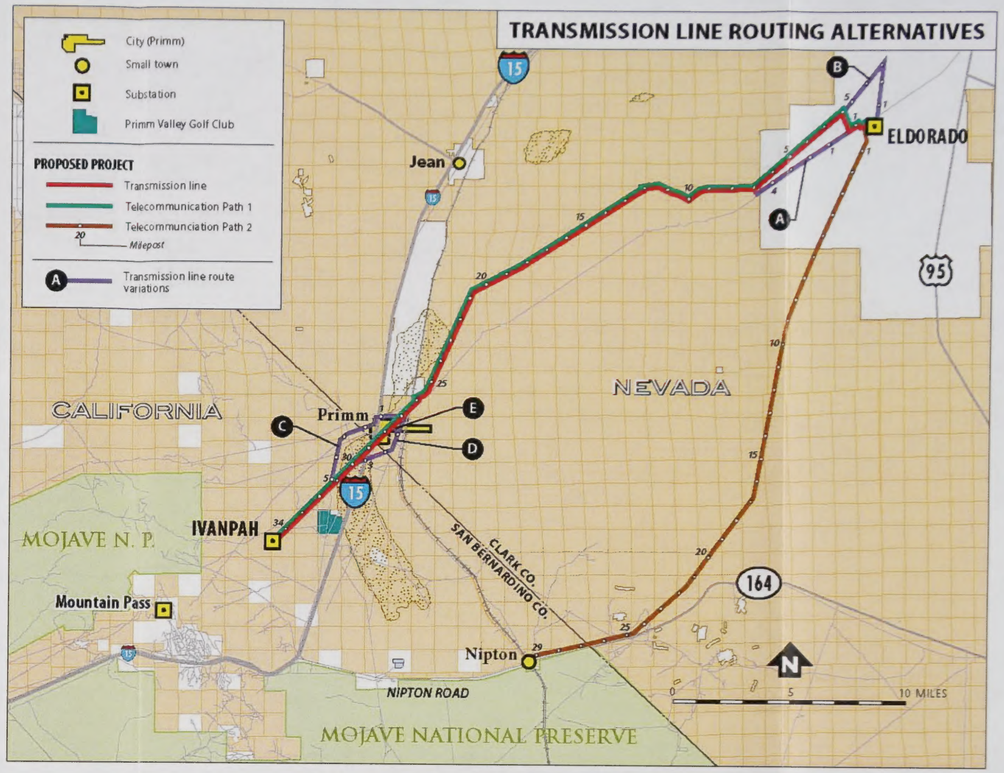

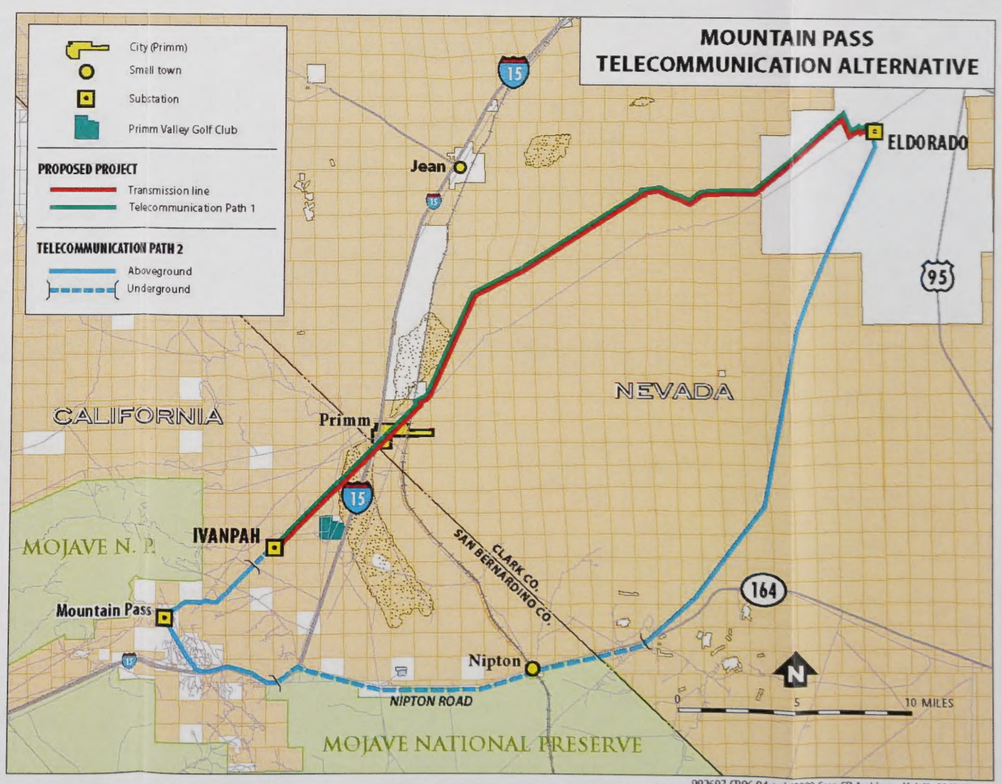

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Figure 2-1

Project Overview

Eldorado–Ivanpah Transmission Project

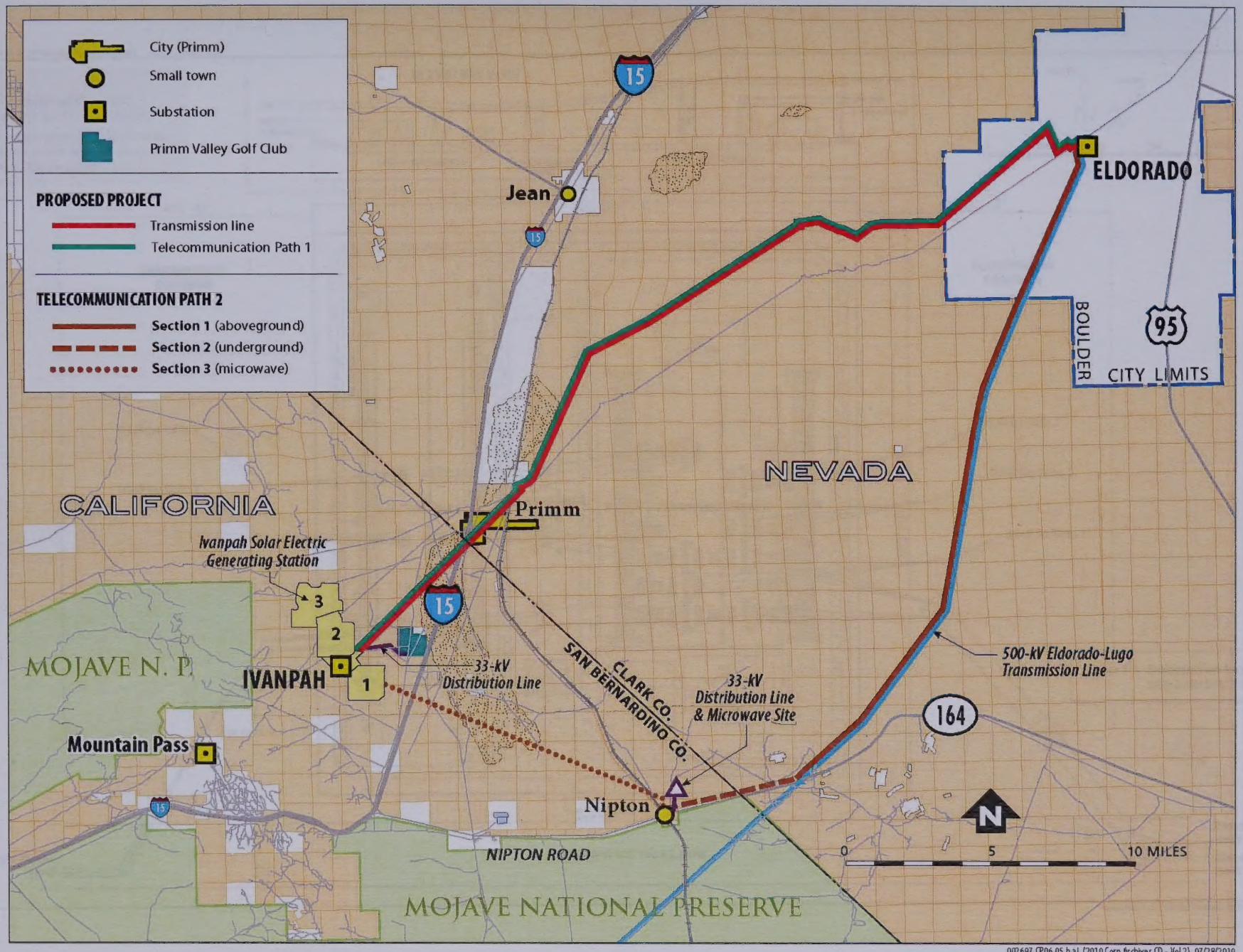
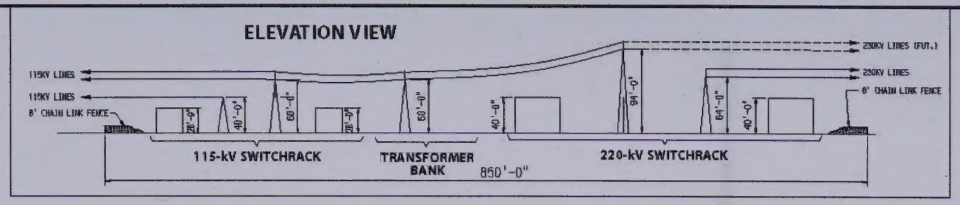
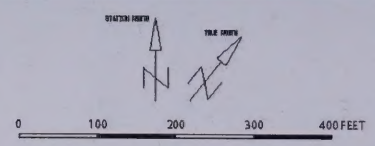


Figure 2-3 **Proposed Project**

Source: *Plot Plan for P.E.A.*, Southern California Edison, June 17, 2008

Notes:
1) The footprint of the entire substation is 1,015 ft. x 1650 ft.
2) The final location for MEER and microwave tower will not be known until final engineering.





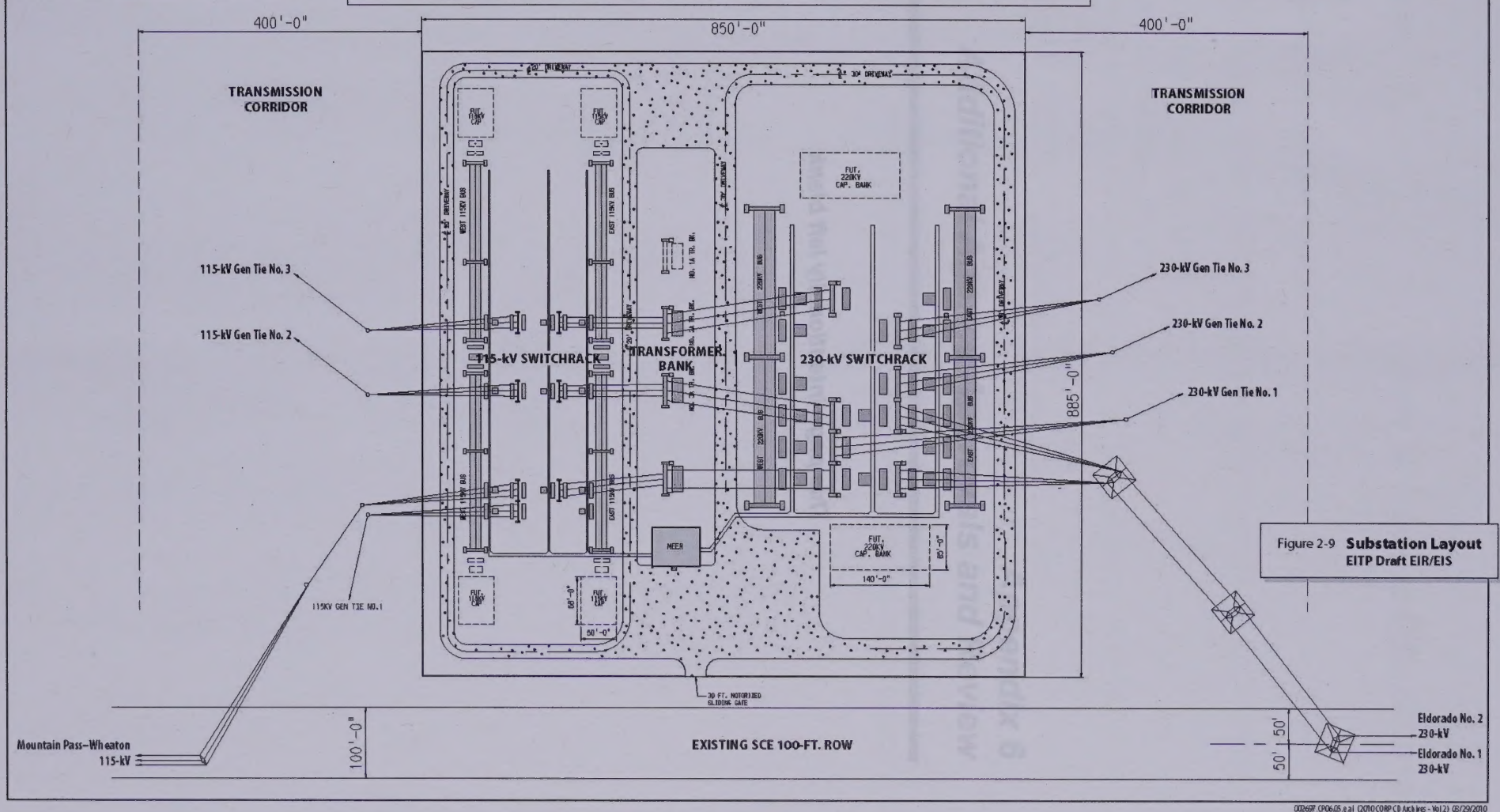


Figure 2-9 **Substation Layout**
EITP Draft EIR/EIS

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Appendix 6
Additional Agency Approvals and Review

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COM/MP1/gd2 **Date of Issuance 12/27/2010**

Decision 10-12-052 December 16, 2010

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of the Southern California Edison Company (U 338 E) for a Certificate of Public Convenience and Necessity for the Eldorado-Ivanpah Transmission Project.	Application 09-05-027 (Filed May 28, 2009)

DECISION GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE ELDORADO-IVANPAH TRANSMISSION PROJECT

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DECISION GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE ELDORADO-IVANPAH TRANSMISSION PROJECT

1. Summary

This decision grants Southern California Edison Company (SCE) a certificate of public convenience and necessity (CPCN) for the Eldorado-Ivanpah Transmission Project, using the Environmentally Preferred Route, as identified in the Final Environmental Impact Report. This route corresponds to the project as proposed by the Applicant.[1] The Eldorado-Ivanpah Transmission Project is to be located in San Bernardino County, California and Clark County, Nevada. The Commission's permitting review for a CPCN for a transmission project by an investor owned utility involves two concurrent processes: (1) a Commission proceeding assessing the project's public interest and cost pursuant to Public Utilities Code § 1001 et seq. and (2) an environmental review pursuant to California Environmental Quality Act (CEQA), Public Resources Code §§ 21000, et seq.

As the Lead Agency in the State of California for the environmental review of the project, the Commission finds the Joint Environmental Impact Report/Environmental Impact Statement prepared by the Commission and the United States Bureau of Land Management for this project meets the requirements of the CEQA, Public Resources Code §§ 21000, et seq. The Commission also finds overriding considerations that merit construction of the project notwithstanding its significant and unavoidable environmental impacts, as detailed in the environmental report. Accordingly, the Commission certifies

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[1] Joint FEIR/EIS at 4-7.

the final environmental report in accordance with CEQA Guidelines § 15090. A copy of the final document can be found on the Commission's website at http://www.cpuc.ca.gov/Environment/info/ene/ivanpah/Ivanpah.htm.

We also find that the Applicant has met its burden of proof and that the project is "necessary to facilitate" achievement of the renewable power goals of § 399.11 *et seq.* pursuant to Public Utilities Code § 399.2.5. Consistent with this, we find that the project is eligible for back-stop cost recovery. The role this line will play in achieving the state's 20 percent renewable mandate and our greenhouse gas mitigation goals under Assembly Bill 32[2] serve as the basis for a finding of overriding considerations, recognizing that the Final Joint Environmental Impact Report/Environmental Impact Study (EIR/EIS) determined that the project will have several significant and non-mitigable impacts.[3]

SCE's estimated costs for the proposed construction are approximately $306 million plus contingency and other related expenses. We find that the cost of the line, subject to a reduction in the proposed contingency amount is reasonable. A cost cap is adopted in accordance with Pub. Util. Code § 1005.5 in the amount of $306.338 million plus a 15% contingency.

In addition, pursuant to General Order 131-D and Decision 06-01-042, the Commission certifies that this project is in compliance with the Commission's policies governing the mitigation of electromagnetic field effects using low-cost and no-cost measures.

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[2] Stats. 2006, ch. 488.

[3] Joint FEIR/EIS at 6-3.

Accordingly, the Commission approves the Applicant's request for a certificate of public convenience and necessity.

This proceeding is closed.

2. Background

Southern California Edison Company (SCE or Applicant) is an investor-owned public utility operating an interconnected and integrated electric utility system that generates, transmits, and distributes electric energy in portions of Central and Southern California.[4] In addition to its California properties, SCE separately or jointly owns facilities in Nevada, Arizona, and New Mexico that produce power and energy for use in California.

2.1. The Eldorado-Ivanpah Transmission Project

SCE is proposing to construct the Eldorado-Ivanpah Transmission Project in order to access renewable generation near the southern California-Nevada border.[5] The Eldorado-Ivanpah Transmission Project would primarily consist of (1) the construction of a new 220/115 kV substation, the Ivanpah Substation, in San Bernardino County to serve as a collector hub for solar generation projects identified in the Eastern Mojave Desert Area, know as the Ivanpah Dry Lake

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[4] SCE's service territory is located in 15 counties in Central and Southern California, consisting of Fresno, Imperial, Inyo, Kern, Kings, Los Angeles, Madera, Mono, Orange, Riverside, San Bernardino, Santa Barbara, Tulare, Tuolumne, and Ventura Counties, and includes approximately 179 incorporated communities and outlying rural territories. SCE also supplies electricity to certain customers for resale under tariffs filed with the Federal Energy Regulatory Commission.

[5] SCE Application at 1.

Area;[6] (2) removal of 35 miles of an existing 115 kilovolt (kV) transmission line between the new Ivanpah Substation and the existing Eldorado Substation, located near Boulder City, Nevada, and the construction of a double-circuit 220 kV line (28 miles in Nevada and seven miles in California) within expanded rights-of-way, and (3) construction of two separate telecommunication routes (Path 1 and Path 2) to support redundant telecommunications for a Special Protection System (SPS).[7]

The project is intended to provide the electrical facilities necessary to integrate up to 1,400 megawatts (MW) of new renewable generation from the Ivanpah Dry Lake Area[8] and will be configured to allow for future network upgrades to further increase renewable resource integration beyond 1,400 MW.[9] SCE states this project is needed to integrate renewable generation so that it and other utilities meet their goal of 20% by 2010 and 33% by 2020.

Land uses within the area range from open space and conservation/ preserve areas to commercial, public, private, and recreation; utility/energy uses; industrial and mining uses; transportation; and limited residential uses.[10] Lands in the area with special designations include the Mojave National Preserve,

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[6] The phrase "Ivanpah Dry Lake Area" is used repeatedly throughout documents filed by Applicant and within the Joint EIR/EIS. The exact definition of this area is not specified. August 9, 2010 RT 37:16-28; 41:2-7; 54:16-20.

[7] SCE Application at 1-2.

[8] SCE Opening Brief at 8.

[9] SCE PEA at 1.4.

[10] Joint Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) at 3.9-1.

wilderness areas (Wee Thump, Joshua Tree, and South McCullough), and Areas of Critical Environmental Concern (ACECs).[11] The project would be located on lands primarily managed by the U.S. Department of the Interior, Bureau of Land Management (BLM).

2.2. Procedural History

This proceeding commenced on May 28, 2009 when SCE filed Application (A.) 09-05-027, a request for a certificate of public convenience and necessity (CPCN) to construct the Eldorado-Ivanpah Transmission Project.[12] The Commission's permitting review for a transmission CPCN involves two concurrent processes: (1) a Commission proceeding assessing the project's public interest and cost pursuant to Public Utilities Code 1001 et seq. and (2) an environmental review pursuant to California Environmental Quality Act (CEQA), Public Resources Code §§ 21000, et seq. Consistent with CEQA, SCE's Application included a Proponent's Environmental Assessment (PEA), the document presenting the Applicant's environmental review of the project.

On June 22, 2009, the assigned Administrative Law Judge (ALJ) issued a ruling directing SCE to amend its Application to include, among other things, the requisite cost information. This ruling was made pursuant to Rule 3.1 of the Commission's Rules of Practice and Procedure and its General Order (GO) 131-D. This ruling also delayed the start of the protest period until the Application was amended and re-served. SCE filed its amendment on

---

[11] *Ibid.*

[12] The docket card for A.09-05-027, including documents filed with the Commission, is available at www.cpuc.ca.gov.

September 22, 2009 and its Application was subsequently noticed in the Commission's Daily Calendar on September 25, 2009 (referred to herein as "Application").

The Commission's Division of Ratepayer Advocates (DRA) filed a timely protest to the Application. Brightsource Energy, Inc. (Brightsource), the parent corporation of several renewable generation developers in the Ivanpah Dry Lake Area, filed a timely response in support of SCE's Application. On December 2, 2009, the assigned ALJ held a prehearing conference at the Commission in San Francisco, California. Several months later, on July 14, 2009, the assigned Commissioner issued a scoping memo, as required by statute,[13] which set forth the following issues to be addressed in the proceeding:

> 1. Does the project serve a present or future convenience and necessity, and meet the requirements set forth in Pub. Util. Code § 399.2.5 and § 1001 et seq.? If so, which project or alternative most effectively or feasibly meets that need?
>
> 2. What are the significant environmental impacts of the proposed project?
>
> 3. Are there potentially feasible mitigation measures that will eliminate or lessen the significant environmental impacts?
>
> 4. As between the proposed project and the project alternatives, which is environmentally superior?
>
> 5. Are the mitigation measures or project alternatives infeasible? (CEQA Guideline 15091(a)(3).) This issue includes consideration of

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[13] *Joint Assigned Commissioner and Administrative Law Judge's Scoping Memo Ruling* (Scoping Memo), December 21, 2009.

the proposed and alternative projects' impact on community values pursuant to Pub. Util. Code § 1002(a)(1).

6. To the extent that the proposed project and/or project alternatives result in significant and unavoidable impacts, are there overriding considerations pursuant to CEQA Guidelines § 15093 that merit approval of the proposed project or a project alternative?

7. Were the environmental documents completed in compliance with CEQA, did the Commission review and consider the FEIR prior to approving the project or a project alternative and does the FEIR reflect the Commission's independent judgment? (CEQA Guideline § 15090.)

8. Is the proposed project and/or project alternative designed in compliance with the Commission's policies governing the mitigation of EMF effects using low-cost and no-cost measures? (GO 131-D, Part X.)

9. If a certificate is granted, what is the maximum cost of the approved project? (Pub. Util. Code § 1005.5(a).)

10. Is coordination required with the Nevada Public Utilities Commission? If so, what coordination must take place?

Consistent with the determination in the Scoping Memo, evidentiary hearings were held for several days in August 2010. A few weeks prior to those hearings, Center for Biological Diversity filed a *Motion to Reconsider and Amend Joint assigned Commissioner and Administrative Law Judge's Scoping Memo Ruling* (dated July 16, 2010). SCE and Brightsource filed timely responses in opposition to the Center for Biological Diversity's motion. A reply was then filed by Center for Biological Diversity. The motion sought permission to present testimony at

hearings on environmental issues that "have not been adequately addressed in the Draft Environmental Impact Report."[14] In support of its request, the Center for Biological Diversity cited to *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1201. In opposing the request by the Center for Biological Diversity, SCE relied on the language of the Scoping Memo.[15] "[Environmental] issues are within the scope of the CEQA review and should be pursued within that environmental review process. No evidentiary hearings or further evidence is needed on these issues."[16] Both SCE and Brightsource offered supplementary testimony in response to the testimony attached to the motion by Center for Biological Diversity. The assigned ALJ, after hearing arguments on the merits of the motion and the responses in opposition, denied the Center for Biological Diversity's motion.[17] We affirm this ALJ's ruling and all other rulings made in this proceeding.[18]

SCE's filing of its CPCN Application also started the required environmental review of the Applicant's request. The environmental review takes place under CEQA. The CEQA review is a concurrent and mostly separate

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[14] Center for Biological Diversity July 16, 2010 motion at 1.

[15] SCE July 21, 2010 response to motion at 4.

[16] SCE July 21, 2010 response to motion at 4.

[17] August 9, 2010 RT 10:5-13.

[18] In this ruling, the assigned ALJ did not enter the testimony offered by Center for Biological Diversity, Brightsource, and SCE into the evidentiary record but preserved it in the file for purposes of potential appeal. This testimony was not subject to cross-examination. Some parties cite these materials in their formal filings, such as opening and reply briefs, in this proceeding. All references to this testimony in opening or reply briefs will be given no evidentiary weight.

analysis from Public Utilities Code § 1001 et seq. In this instance and because the proposed construction would take place on federal lands, the Commission agreed to conduct its environmental review jointly with the federal lead agency, BLM, under National Environmental Policy Act of 1969, as amended (NEPA).[19]

The joint NEPA and CEQA scoping process[20] commenced, respectively, on July 27, 2009 with BLM's publication in the Federal Register of a Notice of Intent to prepare an Environmental Impact Statement (EIS) and on July 24, 2009 with the Commission's issuance of a Notice of Preparation of an Environmental Impact Report (EIR).[21]

BLM and the Commission, together with their environmental consultants,[22] prepared for and jointly held two scoping meetings, on July 28, 2009 in Nipton, California, which is located along the proposed route and on the boundary of the Mohave National Preserve,[23] and on July 29, 2009 in Las Vegas, Nevada.[24] The scoping process, including the related meetings, is intended to ensure that significant public issues, alternatives, and impacts are addressed in environmental documents. The scoping process also determines

---

[19] Joint FEIR/EIS at 1-1.

[20] Joint FEIR/EIS at 7-1. Scoping is required by CEQA for project of "statewide, regional or area-wide significant" per § 21083 of the Public Resources Code and similar federal law.

[21] Joint FEIR/EIS at 7-2.

[22] The Commission and BLM prepared, via their third-party consultant, Ecology and Environment, Inc. a joint EIR/EIS.

[23] Joint FEIR/EIS, Appendix E at 3.

[24] Joint FEIR/EIS at 7-2.

the scope and degree to which these issues raised by the public, alternatives, and impacts will be analyzed.[25] By the close of the scoping period on August 26, 2009, the Commission and BLM received correspondence from public agencies, organizations and private citizens.[26] No verbal comments were received during the scoping meetings.

As a result of the alternative screening process, the Commission and BLM chose seven of the initial 17 alternatives[27] for detailed analysis in the Joint EIR/EIS.[28] The Joint EIR/EIS at Appendix A summarizes the alternatives presented for review, how alternatives were screened out, and provides a record of the screening methodology[29] with conclusions about alternatives carried forward for full EIR/EIS analysis.[30]

The Commission and BLM published the Draft EIR/EIS on April 30, 2010. Comments to the Draft EIR/EIS were submitted by federal and state agencies, private organizations, and environmental groups on or before the end of the CEQA 45-day comment period, June 21, 2010.[31]

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[25] Joint FEIR/EIS at 7-1. This scoping process is discussed in more detail in the Joint EIR/EIS at chapter 7 and is summarized in Appendix E - *Scoping Summary Report.*

[26] Joint FEIR/EIS, Appendix E at 5-14 and Appendix E at Appendix G (Appendix E contains several Appendices, including "G." These Appendices were not published with the Draft EIR/EIS but included in the Final EIR/EIS.

[27] Joint FEIR/EIS at 2-45.

[28] Joint FEIR/EIS at 7-3.

[29] Joint FEIR/EIS, Appendix A-1 at 1-9 (Sec. 2.1 – Alternative Screening Methodology).

[30] Joint FEIR/EIS, Appendix A at 1-1.

[31] These comments can be found at Appendix G, Final Joint EIR/EIS.

The Commission received opening and reply briefs in A.09-05-027 on August 27, 2010 and September 10, 2010.

The Commission released the Final EIR/EIS on November 5, 2010. Federal publication will occur later.

3. Burden of Proof

SCE must demonstrate a need for the Commission to issue the CPCN.[32] The utility "has the burden of affirmatively establishing the reasonableness of all aspects of its application. Intervenors do not have the burden of proving the unreasonableness of [the utility's] showing."[33] Evidence Code § 115 defines burden of proof as follows:

> "Burden of proof" means the obligation of a party to establish by evidence a requisite degree of belief concerning a fact in the mind of the trier of fact .... The burden of proof may require a party to raise a reasonable doubt concerning the existence or nonexistence of a fact or that he establish the existence or nonexistence of a fact by a preponderance of the evidence, by clear and convincing evidence, or by proof beyond a reasonable doubt.

Except as otherwise provided by law, the burden of proof in this proceeding requires proof by a preponderance of the evidence. The preponderance of the evidence is generally the default standard in civil and administrative law cases.[34] We apply that standard in this decision.

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[32] *Investigation into Methodology for Economic Assessment of Transmission Projects*, D.06-11-018 at 22, "The Commission has long held that the applicant carries the burden of proof in a certification proceeding, and we reiterate those determinations today."

[33] D.06-05-016 at 7.

[34] CA Admin. Hearing Practice, 2d Ed. (2005) at 365.

4. Analysis

4.1. Statutory Framework

Public Utilities Code § 1001 et seq. establishes the framework for the Commission's review of this CPCN Application. Several statutory components exist within this framework. Sections 1001, 1002(a), 1002.3 and 399.2.5 address the public interest and other related factors. Section 1005.5 guides the Commission's evaluation of costs.

4.2. Public Utilities Code §§ 1001 and 1002

Section 1001 mandates that, before the Commission can authorize a CPCN for the Eldorado-Ivanpah Transmission Project, it must find the "present or future public convenience and necessity require or will require its construction."[35] A finding of need is required before the Commission may issue a CPCN. We find that SCE has demonstrated need pursuant to §§ 1001 and 399.2.5. In reaching a determination under § 1001, the Commission is required by § 1002(a) to consider four factors: (1) community values; (2) recreational and park areas; (3) historical and aesthetic values; and (4) influence on the environment.[36]

Some of these factors are reviewed as part of the CEQA process. However, the Commission has concluded that § 1002 imposes a "responsibility *independent of CEQA* to include environmental influences and community values in our

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[35] Pub. Util. Code § 1001.

[36] Pub. Util. Code § 1002 (Added by Stats. 1981, ch. 573 § 3) provides, in pertinent part: "The commission, as a basis for granting any certificate pursuant to Section 1001 *shall* give consideration to the following factors:" (Emphasis added.) Those factors are noted above.

consideration of a request for a CPCN."[37] The Commission has also determined that, in evaluating the fourth factor, i.e., consideration of a project's "influence on the environment," it is appropriate to rely on the information gathered as part of the CEQA process.[38]

Regarding the Eldorado-Ivanpah Transmission Project, the Draft Joint EIR/EIS addresses not only the environmental impacts of the project but also the impacts on recreational and park areas and historic and aesthetic values. Accordingly, consistent with the Commission's prior statements, the Commission will look to the CEQA documents to inform its decision on the Eldorado-Ivanpah Transmission Project and also independently consider the information included in the CEQA documents when considering these four factors under § 1002(a).

4.2.1. Community Values

In considering the project's compatibility with community values as set forth in § 1002(a), the Commission gives considerable weight to the views of the local community and, in addition, the views of the elected representatives of the area because the Commission views elected representatives as speaking on

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[37] *Application of Southern California Edison for CPCN for Kramer-Victor Transmission Line,* (1990) 37 CPUC2d 413, 453. (Emphasis added.)

[38] *Application of Lodi Gas Storage for CPCN for Gas Storage Facilities,* D.00-05-048, 28 ["[T]he appropriate place for the parties to address [the issue of a project's influence on the environment] was in the EIR, so that the parties would not duplicate their efforts in both portions of the proceeding."].

behalf of their constituents.[39] No public or elected officials raised objections to this project in the CEQA public comment process or in the formal proceeding. In support of finding the project consistent with community values under § 1002(a), SCE asserts that the project will play a major role in the timely progress towards the Commission's renewable portfolio standard (RPS) goals.[40] As explained in more detail in Section 4.4.1 below, we agree with SCE that the project will advance the state's renewable energy goals, a program that is codified in state law pursuant to Senate Bill 1078 and modified by Senate Bill 107. However, we do not necessarily agree with SCE that the fact that a given project would advance statewide policy goals necessarily equates to compatibility with community values under the statute. Instead, consistent with past Commission decisions, we look to opinions expressed elected officials, or other representatives of the local community. No elected officials voiced concern regarding this project. Accordingly, while we do not have a basis to affirmatively find that the project advances community values; we believe we can reasonably find that the project is not inconsistent with those values.

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[39] *Application of Southern California Gas Company (U904G) to Amend its Certificate of Public Convenience and Necessity for the Honor Rancho Natural Gas Storage Facility*, Decision 10-04-034; 2010 Cal. PUC LEXIS 144, *18.

[40] SCE Opening Brief at 3-5. California Senate Bill (SB) 1078, Stats. 2002, ch. 516, established the RPS program, which was codified originally in California Public Utilities Code Sections 399.11, *et seq.* SB 1078 directed retail sellers of energy to include within their portfolios at least 20% of their total retail electricity sales from renewable generation sources by 2017. *Id.* In 2006, the Legislature enacted SB 107, Stats. 2006, ch. 464, which accelerated this deadline to 2010.

4.2.2. Recreational and Park Areas

In considering the project's impact on recreational and park area as set forth in Pub. Util. Code § 1002(a), we look to the Joint EIR/EIS as providing the most in-depth analysis of this issue.

Chapter 3.12 of the Joint EIR/EIS, entitled "Recreation," establishes that the Ivanpah-Eldorado Transmission Project "is in an area offering a diverse range of recreational opportunities that include caving, photography, paintings, automobile touring, backpacking, bird watching, hunting, primitive camping, hiking, rock climbing, and off-highway vehicles use."[41] Dry lake beds, such as the Ivanpah Dry Lake, are also popular destinations for long-distance archery, kite buggying, and kite demonstrations.[42] Other impacts on recreation include, for example, off-highway recreational vehicle trails currently authorized by BLM that run through the Ivanpah Solar Energy Generating System (ISEGS).[43]

SCE points out that, while its project presents temporary impacts to recreation resulting from construction of the Ivanpah-Eldorado Transmission Project, that impacts during operation and maintenance of the line would be similar its current operations of existing facilities.[44]

While construction of the project presents potential interference with the recreation and park areas, this impact will be short-term. Accordingly, we find

---

[41] Joint FEIR/EIS at 3.12-1 and 3.12-2.

[42] Joint FEIR/EIS at 3.12-3.

[43] The analysis of the factors under § 1002(a)(1) - (4) does not include ISEGS, which was included as part of the Project as a Whole for the CEQA review.

[44] SCE Opening Brief at 5.

that the Eldorado-Ivanpah Transmission Project will not conflict with usages of the recreational and park areas. However, as further explained in Section 6.1.2 of the Final EIR/EIS, the ISEGS project, which is part of the whole of action, would result in significant and unavoidable impacts on land use and recreation due to the permanent conversion of habitat and land used for recreational purposes.[45] Thus while the impact of the Eldorado-Ivanpah Transmission Project when viewed in isolation imposes short-term impacts on recreational and park areas, the whole of the action results in longer term impacts that cannot be avoided.

4.2.3. Historical and Aesthetic Values

We again look to the analysis in the Joint EIR/EIS as providing the most in-depth information of matters related to historical and aesthetic values under Pub. Util. Code § 1002(a). Construction of the Eldorado-Ivanpah Transmission Project would impact cultural resources because of surface and subsurface ground disturbance.[46] This disturbance would result from new road construction, parking in areas off prepared roads, creation and use of temporary laydown areas, and drilling and leveling during construction of tower footings.[47]

SCE has proposed a number of mitigation measures, referred to as Applicant's Proposed Measures, to mitigate these and other similar impacts related to historical and aesthetic values. For example, Applicant's Proposed Measure APM CR-2a provides as follows: Project Final Design would avoid direct impacts on significant or potentially significant cultural resources. To the

---

[45] Joint FEIR/EIS at 6-3.

[46] Joint FEIR/EIS at 3.5-15.

[47] Joint FEIR/EIS at 3.5-15.

extent practical, all ground-disturbing activities and other project components would be sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.[48] In describing the whole of the action, which includes the ISEGS project, the Joint Final EIR/EIS determines that the project will have non-mitigable impacts on visual resources, and furthermore states that these impacts would be significant and unavoidable, and there is no feasible mitigation to reduce this impact to less than significant levels.[49]

Consequently, after consideration of these facts, the Commission finds that the project, with the various Applicant's Proposed Measures, does conflict, to some degree, with historical and aesthetic values.

4.2.4. Influence on the Environment

The Joint EIR/EIS serves as the key reference document when considering the fourth factor, influence on the environment, under Pub. Util. Code § 1002(a).[50] As explained in the Joint EIR/EIS, the project will result in unmitigable[51] significant adverse impacts on biological resources, and air quality.[52]

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[48] Joint FEIR/EIS at ES-18.

[49] Joint FEIR/EIS at 3.2-69.

[50] We certify the FEIR/EIS in Section 6 below.

[51] The term "unmitigable" is used to mean that, it is not possible to avoid the effects or mitigate the effects to a point where no significant effects on the environment would occur. See, e.g., Public Resource Code § 21064.5.

[52] Joint FEIR/EIS at 6-1.

The project would impact several special-status wildlife species and their habitat.[53] However, as noted in the FEIR, while the project would impact several special status wildlife species and their habitat, mitigation would reduce these impacts to less than significant with the notable exception of the impacts on the desert tortoise,[54] which is listed as threatened by the federal government under the Endangered Species Act and by the State of California under the California Endangered Species Act.[55] The ISEGS project and Eldorado-Ivanpah Transmission Project together, as analyzed in the Joint EIR/EIS Whole of the Action, would cause increased road traffic, noise, human presence, disturbance, and general degradation of habitat during construction and operation, all of which are contributors to permanent adverse impacts on desert tortoise.[56] The ISEGS project would result in increased noise levels during daytime operational hours, a loss of desert tortoise habitat in the amount of over 3,582 acres, and increased road traffic increasing desert tortoise road kill hazard.[57] The Eldorado-Ivanpah Project increases the potential for raven predation of desert tortoise. However, the operational impacts of both projects would be significantly reduced by mitigation measures. This includes mitigation compensation required of both projects that would offset adverse impacts to desert tortoise. However, impacts on desert tortoise remain significant even after

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53 *Ibid.*

54 *Ibid.*

55 Joint FEIR/EIS at 3.4-46.

56 Joint FEIR/EIS at 3.4-126, 3.4-127.

57 *Ibid.*

mitigation mainly due to the construction of both ISEGS and Eldorado-Ivanpah Transmission Project.[58] The Eldorado-Ivanpah Transmission Project and the ISEGS project would require relocation and the more intensively impactful translocation, respectively, of desert tortoises that occur during construction within the fenced construction area of the project. Specifically, SCE proposes as an Applicant's Proposed Measure, that "Any tortoise found on the surface would be relocated to less than 1,000 feet away."[59] Nevertheless, the impacts remain "significant and unavoidable."[60]

In addition to its impacts on the desert tortoise, the Joint EIR/EIS also finds that the construction activities undertaken to build the project would result in exceeding the Mojave Desert Air Quality Management District daily significant thresholds for particulate matter emissions ($PM_{2.5}$, PM_{10}), and nitrogen oxides (NO_X) despite the proposed usage of low-emission equipment and fugitive dust control measures. While these daily thresholds may be violated during the construction period, the Joint EIR/EIS also notes that these impacts would be temporary and confined to those times and locations when/where construction is underway.[61]

After taking all the above into consideration, we find the proposed project will have some adverse "influence on the environment" under § 1002(a). The finding that the project will have some adverse impacts relative to several of the

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[58] *Ibid.*

[59] Joint FEIR/EIS at 3.4-68.

[60] Joint FEIR/EIS at Section 3.4-96.

[61] Joint FEIR/EIS at 3.3-16.

factors identified in § 1002(a) is not necessarily determinative. Further analysis is required under the existing statutory framework to determine whether a project, despite it adverse impacts under § 1002(a) in some areas, is still in the public interest. The analysis under §1002(a) is narrow, looking only to the project specific impacts without consideration of the broader policy context into which the project fits. We now turn the broader analysis permitted by § 399.2.5.

Notably, under the "notwithstanding" provision of Public Utilities Code § 399.2.5, as further discussed below, the Commission may find that this project's furtherance of the state's renewable power goals outweigh the environmental concerns identified under § 1001 et seq.

4.3. Public Utilities Code § 1002.3

The next step in the Commission's analysis of SCE's request for a CPCN for the Eldorado-Ivanpah Transmission Project is § 1002.3.[62] Section 1002.3 requires the Commission to "consider cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity, including, but not limited to, demand-side alternatives such as targeted energy efficiency, ultraclean distributed generation...and other demand reduction resources." When an environmental impact report in being prepared,

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[62] Section 1002.3, effective January 1, 2006, was enacted in 2005 (Stats. 2005, ch. 366, Sec. 5), three years after § 399.2.5, as part of a larger energy efficiency bill, Senator Kehoe's SB 1037 and provides in full as follows: "In considering an application for a certificate for an electric transmission facility pursuant to Section 1001, the commission shall consider cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity, including, but not limited to, demand-side alternatives such as targeted energy efficiency, ultraclean distributed generation, as defined in Section 353.2, and other demand reduction resources."

pursuant to CEQA, an analysis of the non-wires alternatives is preferably included as an alternate to the proposed transmission line projects.

Consistent with § 1002.3, the Commission considered "non-wires" alternatives as part of its environmental review.[63] While a full analysis was not in the Draft EIR/EIS, this analysis was included in the Final EIR/EIS published on November 5, 2010, in response to comments on the Draft EIR/EIS. The evaluation of System Alternatives was modified to include two separate scenarios or sub-alternatives: in-basin generation and demand-side alternatives. These alternatives are further explained in Appendix A-1 to the Final Joint EIR/EIS. Appendix A-1 also explains the rationale for screening-out "non-wires" for further analysis.

Appendix A-1 to the Final Joint EIR/EIS suggests that demand-side and energy efficiency alternatives within the state could potentially result in 2.5 times more generation capacity than the generation capacity near the Ivanpah Dry Lake Area:

> In order to compare the capacity of the demand-side scenario to the capacity of the proposed project, it should be considered the potential capacity of additional renewable generation projects to be constructed in the Ivanpah Valley area and connected to the upgraded EITP transmission line should be considered. The proposed transmission line would be constructed within the Mountain Pass CREZ, which has an estimated generation capacity of 1,200 MW (CAISO 2009). Therefore, if all of the currently proposed demand-side generation projects were constructed and implemented before 2020, they would

[63] Appendix A-1 of Joint FEIR/EIS.

theoretically have 2.5 times over the generation capacity than the proposed project.[64]

During the environmental review process, the Center for Biological Diversity argued that non-wires alternatives exist and are less expensive than the Eldorado-Ivanpah Transmission Project. The Center for Biological Diversity relies on a number of studies, including a Commission report, which concludes that there would be little difference in the cost of meeting state renewable energy targets by relying predominantly on distributed photovoltaic (PV), when current state-of-the-art pricing is assumed, instead of building 10,000 MW of remote solar capacity under the 33% RPS reference case.[65]

The Final Joint EIR/EIS initially finds that demand-side alternatives could theoretically serve any capacity needs met through the potential generation interconnecting with the Eldorado-Ivanpah Transmission Project.[66] However, the conclusion of the Final Joint EIR/EIS is that the non-wires alternative will not be carried forward for full analysis under CEQA because it is highly speculative that the amount of "non-wires" generation needed to off-set the generation in the Ivanpah Dry Lake Area is feasible.[67] Furthermore as noted in the FEIR, the non-wires alternative would fail to meet one of the primary, and in our view, one of the principle objectives of the project, namely the interconnection of the

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[64] Joint FEIR/EIS at Appendix A-1 (Ap1-16).

[65] Joint FEIR/EIS at Comments by Center for Biological Diversity at Appendix G, comment 0024, citing the Commission's, *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, June 2009, at 31.

[66] Appendix 1, at Ap. 1-14 through Ap. 1-18 of the Joint FEIR/EIS.

[67] Appendix Ap1 at Ap1-15-Ap1-19 of the Joint FEIR/EIS.

renewable resources in the Ivanpah Dry Lake Area, including four projects with Commission approved PPAs.[68] On this basis, the Commission concludes it has met its obligations under 1002.3 to "consider cost-effective alternatives" to transmission facilities.[69]

4.4. Public Utilities Code § 399.2.5

The next step in the Commission's analysis is to determine whether § 399.2.5 applies here. Section 399.2.5 was originally enacted as § 399.25 on September 12, 2002, as part of SB 1078. Section 399.25 was re-codified as § 399.2.5, but the text remained unchanged.[70] Section 399.2.5 was recently amended, but the amendments are not relevant to the discussion here.[71]

Section 399.2.5 authorizes the Commission to deem necessary those transmission facilities identified in CPCN applications if the proposed facilities are *necessary to facilitate achievement of the State's renewable power goals.* The State's renewable power goals, described, in part, in § 399.11, include the goal "to attain a target of generating 20 percent of total retail sales of electricity in California from eligible renewable energy resources by December 31, 2010..." Section 399.2.5 also provides a "backstop" cost mechanism allowing the utilities to recover through retail rates any prudently incurred costs that are not approved by the Federal Energy Regulatory Commission for recovery through transmission rates. The Commission implemented the cost recovery provisions

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[68] SCE Opening Brief at 8-9.

[69] Appendix Ap1 at Ap1-15-Ap1-19 of the Joint FEIR/EIS.

[70] Stats. 2008, Ch. 558, Sec. 22. Effective January 1, 2009.

[71] AB 1954 (Skinner/Perez), Stats. 2010, Ch. 460. Effective January 1, 2011.

of § 399.2.5 in D.03-07-033 and in D.06-06-034. Because the proposed project is intended to interconnect renewable generation in furtherance of the state's goal pursuant to § 399. 11, we find that the provisions of § 399.2.5 apply here.

In this proceeding, SCE characterizes the "need" analysis under § 399.2.5 as establishing a presumption of need.[72] Moreover, in a recent case, the Commission stated "Section 399.2.5 explicitly supersedes § 1002 in determinations of need for a CPCN."[73] To clarify, no presumption of need is created and, while § 399.2.5 permits the Commission to, in essence, "supersede" §§ 1001-1013, such authority is only provided *after* the Commission fully considers the requirements of §§ 1001-1013, including the analysis required by § 1002.

Accordingly, the determination of "need" under § 399.2.5, and the availability of backstop cost recovery under that section, necessarily must occur at the *end* of a CPCN proceeding, after the Commission evaluates all of the evidence of need under §§ 1001-1013. This sequence of review brings meaning to the "notwithstanding" provision of § 399.2.5. It is only at the end of the Commission's need analysis under §§ 1001-1013 that the provisions of § 399.2.5 provide the Commission with the authority to find that "notwithstanding" the results of its analysis under §§ 1001-1013, the project may be found "necessary to facilitate" achievement of the renewable power goals of § 399.11 et seq. and, therefore, approved by the Commission.

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[72] SCE Opening Brief at 6, "Among other things, Section 399.2.5 creates a presumption of need for transmission projects that facilitate delivery of renewable energy to the grid."

[73] D.09-12-044 at 18.

We have, above, considered the relevant provisions of §§ 1001-1013. We now turn to the § 399.2.5 analysis, the three-prong test for which projects would qualify as "necessary to facilitate" achievement of the States' renewable power goals under § 399.11 et seq., and thereby qualify for cost recovery under the statute.

4.4.1. Three Prong Test

In D.07-03-012,[74] the Commission established the following three prong test for which projects would qualify as "necessary to facilitate" achievement of the State's renewable power goals under § 399.2.5, and thereby qualify for the cost recovery under the statute:

> (1) that a project would bring to the grid renewable generation that would otherwise remain unavailable; (2) that the area within the line's reach would play a critical role in meeting the RPS goals; and (3) that the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance.[75]

The first prong requires that the Eldorado-Ivanpah Transmission Project bring to the grid renewable generation that would otherwise remain unavailable. Unlike other recent transmission projects, this project is not being developed to meet demand.[76] The main purpose of the project is to bring yet-to-be constructed wind and thermal solar projects to the CAISO-controlled grid. SCE's current

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[74] D.07-03-012 (The decision approving Segment 1 of the Tehachapi Renewable Transmission Project.)

[75] D.07-03-012 at 16. Applied in D.07-03-045 and D.09-12-044.

[76] The Final EIR/EIS finds that accessing renewable energy is the purpose of the project with "energy demand met by other means." (Final EIR/EIS at 6-9.)

interconnection capability in the Ivanpah Dry Lake Area is limited to approximately 80 MW via the existing line between the Mountain Pass Substation and the Eldorado Substation, on the Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115 kV transmission line.[77]

The renewable generation projects identified for potential interconnection with the Eldorado-Ivanpah Transmission Project are in various stages of development. No projects are presently generating renewable electricity. Some of these renewable generation projects present an initial start date of a few years away, perhaps as early as 2013,[78] while other projects are more speculative.

In the context of renewable energy development, it is often the case that transmission must be planned and permitted before generation fully commits to an area. This is the situation here. Furthermore, in this case generation developers, and by extension, their financial backers, need assurance that if generation is built, their projects will be able to bring their energy to market. Once planned and permitted, transmission to the Ivanpah Dry Lake Area is likely to increase interest in a renewable generation development. Consequently, in this case, the Commission is looking to the renewable potential for the area that the transmission line will serve as an indicator of the need for the proposed line. Our analysis continues to emphasize the amount of generation already under RPS contracts with the investor owned utilities, and, in this case, gives

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[77] Exhibit SCE-5, Section A at 8:20-26.

[78] The initial synchronization may occur a few months early, in November 2012. SCE Advice Letter 2339.

some weight to the number of interconnection requests in the area as an indicator of future growth.

Based on Commission-approved PPAs, the reasonably foreseeable capacity that can be expected to interconnect to Eldorado-Ivanpah Transmission Project is considerable. Four solar projects totaling 717 MW[79] of renewable generating capacity in the Ivanpah Dry Lake region have CPUC-approved PPAs with investor owned utilities. All of these projects have filed interconnection requests with the CAISO and are seeking interconnection to the CAISO system through Eldorado-Ivanpah Transmission Project.[80] Notably, and consistent with the requirements and applicability of § 399.2.5, all of these projects were approved in part because of the contribution they are expected to make toward California's 20% RPS goals.[81]

We disagree with DRA's position, as presented in briefs, that these projects are not sufficiently mature or certain to justify a need determination for the proposed transmission project.[82] These generation projects have Commission approved PPAs, and as such have been assessed and were ultimately endorsed by the Commission based not only on cost relative to other resource options, but

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[79] Exhibit SCE-8.

[80] Exhibit SCE- 14

[81] The 717 MW of capacity, as reflected in Exhibit SCE-8, are represented by four PPAs, two with SCE, Solar Partners 1 and Desert Stateline, and two with PG&E, Brightsource PPA 1 and Brightsource PPA 2. These projects were approved via Resolutions E-4261, E-4347, and E-4266, respectively. Each resolution contains language expressly recognizing the role these projects are anticipated to play in meeting the 20 percent RPS goal. (See, E-4261 at 8, E-4347 at 7, and E-4266 at 9.)

[82] DRA Opening Brief at 10-13.

also on the basis of project viability. As such we find that these projects are strongly indicative of a line that if built, will be utilized.

This conclusion is further supported by information regarding potential generation projects in the Renewable Energy Transmission Initiative (RETI) Phase 2B report regarding the region's resource potential. DRA also makes a number of arguments questioning whether the energy from the projects that are anticipated to interconnect to Eldorado-Ivanpah Transmission Project will deliver energy to California end use customers.[83] The extent to which projects will serve end use customers consistent with the eligibility requirements of the RPS program are fully addressed when the Commission reviews contracts submitted by the utilities as part of their RPS procurement activities. We find DRA's concerns in this regard to be misplaced and out of scope to the extent they have failed to demonstrate that the resources anticipated to utilize this line are ineligible under the RPS.

Of the projects with Commission approved PPAs, we note that the project by Brightsource's subsidiary companies, the Ivanpah Solar Energy Generating System project or ISEGS, is the project furthest along in the permitting process, having received the necessary permits or approvals by the California Energy Commission and BLM. ISGES initiated construction soon after October 27, 2010.[84] ISEGS alone could serve to satisfy the first prong the Commission's test under § 399.2.5, that a proposed transmission project would

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[83] DRA Opening Brief at 7-9.

[84] http://www.brightsourceenergy.com/images/uploads/press_releases/Ivanpah_Groundbreaking_Press_Release.pdf.

bring to the grid renewable generation that would otherwise remain unavailable. However, as stated by Brightsource, other transmission options exist for the project.[85]

While other transmission options may exist, we find that the substantial amount of renewable capacity represented not only by Brightsource's ISEGS project, but also by the capacity associated with the other Commission-approved renewable PPAs in the region results in the need for additional transmission capacity. This has been confirmed by the CAISO, which, in its studies responding to these projects' respective interconnection requests, has indicated that Eldorado-Ivanpah Transmission Project would be required.[86]

It is also notable, that in addition to those projects with approved PPAs, there is approximately 964 MW of renewable generation in the CAISO Generation Queue[87] that would, if realized, potentially interconnect to Eldorado-Ivanpah Transmission Project. Furthermore, the region has been identified in the RETI Phase 2B report as having substantial renewable potential,

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[85] Brightsource June 21, 2010 comments to the Joint FEIR/EIS at 2, included in Joint FEIR/EIS in Appendix G at comment 0016.

[86] DRA Exhibit C-302-A CAISO confidential documents:

Interconnection System Impact Study, Generation Interconnection DPT2 Project Final Report at ii, iii.

Interconnection System Impact Study, Generation Interconnection, LLC., DPT1 Project Final Report at ii, iii.

Interconnection System Impact Study, Generation Interconnection, Ivanpah Solar Electric Generating System 3 Final Report at ii, iii.

[87] Exhibits SCE-9, 10 and 11.

with an estimated 958 MW of potential in the Mountain Pass Competitive Renewable Energy Zone (CREZ) and 5,042 MW of potential in the Nevada-Southwest area.[88]

Having approved renewable PPAs expressly seeking interconnection to a given transmission facility is helpful in ensuring that lines built to access renewables are fully utilized and the risk of stranded costs is reduced accordingly. Here, we not only have Commission-approved PPAs that collectively exceed the available capacity of the existing CAISO system, but strong commercial interest in the region as evidenced by the CAISO interconnection queue, and a regional assessment, RETI, that confirms the region has substantial renewable resource potential to justify this interest. Based on this information, and the limited capacity available on SCE's existing lines, to facilitate interconnection of these resources to the CAISO system, additional transmission capacity is needed.

In light of the forgoing discussion, we conclude that Eldorado-Ivanpah Transmission Project meets the first and second prongs of the three prong test used to determine if a project meets the "necessary to facilitate" language of § 399.2.5. The Eldorado-Ivanpah Transmission Project satisfies the first prong of the test because it will facilitate interconnection with those generation projects with Commission-approved PPAs located in the area. Furthermore, the considerable amount of renewable potential in the region, beyond those projects with Commission-approved PPAs, as demonstrated by the substantial amount of

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[88] RETI Phase 2B Final Report, 1-10 – 1-12. http://www.energy.ca.gov/2010publications/RETI-1000-2010-002/RETI-1000-2010-002-F.PDF.

generation in the CAISO Generation Queue, and the results of the RETI Phase 2B study, convinces us that the project satisfies the second prong.

Accordingly, we find that the Applicant has established by a preponderance of the evidence that Eldorado-Ivanpah Transmission Project is needed to bring to the grid renewable generation that would otherwise remain unavailable and that the area within the line's reach would play a critical role in meeting the state's RPS goals.

We now turn to the third prong, regarding whether the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance. Based on the existing PPAs, as well as the identified resource potential in the region, we believe the line would, if built, contribute toward economically rational RPS compliance. This leaves the question of whether or not the costs of this line are reasonably balanced against this opportunity. As described in more detail below, we find that the cost of the project, as modified herein, is reasonable given the project scale and scope, thus satisfying the third prong. In light of the forgoing discussion we find that the project meets the requirements of the three prong test and is, thus, "necessary to facilitate achievement of the renewable power goals established in Article 16."

4.4.2. Back-Stop Cost Recovery

After the Commission determines a transmission project is "needed" under § 399.2.5, the project is then eligible for backstop cost recovery for prudently incurred transmission costs "resulting from the construction of the transmission facilities that are not approved for recovery in transmission rates by

[Federal Energy Regulatory Commission]..."[89] Thus, SCE must seek to recover costs for transmission projects through Federal Energy Regulatory Commission jurisdictional rates and, if Federal Energy Regulatory Commission denies recovery, § 399.2.5(b)(4) permits recovery of transmission rates through the retail rates governed by the Commission.

The provisions of § 399.2.5 apply to new transmission facilities "necessary to facilitate achievement of the renewable power goals." These renewable power goals are set forth in § 399.11. As explained in the preceding section, we find that the Applicant has demonstrated that the project is needed, consistent with the requirements of § 399.2.5. Therefore we find that the project is eligible for backstop cost recovery.

Section 399.2.5 (b)(4) ensures retail rate recovery of prudently-incurred costs for projects the Commission finds to be necessary to facilitate RPS compliance to the extent that cost recovery is not otherwise available.

There is no question that the Eldorado-Ivanpah Transmission Project qualifies for cost recovery under § 399.2.5(b)(4). D.06-06-034 defined certain types of facilities that would qualify for cost recovery under § 399.2.5(b)(4), including:

> High voltage, bulk-transfer transmission facilities, whether classified as network or gen-tie, that are designed to serve multiple RPS-eligible generators where it has been established that the amount of added transmission capacity will likely be utilized by RPS-eligible generation projects within a reasonable period of time .... (D.06-06-034, mimeo., Finding of Fact 8).

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[89] Pub. Util. Code § 399.2.5(b)(4).

As described above, we find that the Eldorado-Ivanpah Transmission Project is necessary as that term is used in the context of § 399.2.5, because it will be used interconnect renewable resources that will contribute to the 20% RPS goal. That the proposed project is a high voltage, bulk-transfer transmission facility is not disputed. Consequently, it is appropriate to provide SCE assurance of recovery of prudently incurred costs, and we do so here.

Section 399.2.5 also requires the Commission to direct "the utility…to seek the recovery through general transmission rates of the costs associated with the transmission facilities." Therefore, we direct SCE to first seek cost recovery at Federal Energy Regulatory Commission through general transmission rates for the costs incurred in building this project. Further, we reiterate our finding in D.06-06-034: "§ 399.25 is not meant to substitute for the existing cost recovery mechanisms available to support transmission development, nor is it intended to change the ultimate cost responsibility of generators and utility ratepayers." (*Id.* at p. 28). "Nothing in this decision is intended to relieve renewable generators from their responsibility for their fair share of the costs of non-network transmission facilities necessary to interconnect the generator with the network." (*Id.* at Findings of Fact 7.)

We affirm, consistent with D.06-06-034, that, notwithstanding the likelihood of cost recovery through Federal Energy Regulatory Commission wholesale rates, it is appropriate for SCE to continue to track its project costs consistent with the terms of the memorandum account approved by the Commission in response to SCE Advice Letter 2345-E.[90] Both the statute and

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[90] CPUC Resolution E-3405 (December 17, 2009).

D.06-06-034 anticipate that first Federal Energy Regulatory Commission would act, and that this Commission would step in only if Federal Energy Regulatory Commission disallows recovery of some costs. Thus, any consideration of cost recovery by this Commission would only come after Federal Energy Regulatory Commission had finished its work.

5. California Environmental Quality Act

CEQA and § 1002(a) require the Commission to consider the influence of the Applicant's request on the environment.[91] Toward that goal, CEQA requires the Commission, as the Lead Agency, to conduct a review to identify environmental impacts of the project and ways to avoid or reduce significant environmental damage. This review is documented in a joint EIR/EIS. The EIR/EIS serves to disclose any environmental impacts associated with a proponent's project, list mitigation measures to minimize any significant environmental effects of the project, and provide project alternatives. This information is used to assist the Commission in determining whether to issue a CPCN. CEQA precludes a lead agency from approving a proposed project unless the lead agency requires the project proponent to eliminate or substantially lessen all significant effects on the environment where feasible, and determines that any unavoidable remaining significant effects are acceptable due to overriding considerations. CEQA requires that, prior to approving the project or a project alternative, the lead agency certify that the environmental review was conducted in compliance with CEQA, that it reviewed and considered the

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[91] Public Resources Code §§ 21000, et seq.

EIR prior to approving the project or a project alternative, and that the EIR reflects its independent judgment.[92]

5.1. Applicant's Proponent's Environmental Assessment, Project Objective, Project as a Whole, and Alternatives

5.1.1. Proponent's Environmental Assessment and the Statement of Objectives

SCE filed a PEA with its Application. A PEA is required to contain a statement of objectives. The purpose of the statement of objectives is to help the lead agency develop a reasonable range of alternatives to evaluate and aide the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should also include the underlying purpose of the project. (CEQA Guidelines § 15124.) SCE's project objective is reproduced below:[93]

> 1. Comply with the state-mandated Renewables Portfolio Standard (RPS) (i.e., 20 percent renewable by year 2010 per California Senate Bill 107[1]) in an orderly, rational, and cost effective manner, while also considering the need for maintaining reliable electric service during the upgrade and/or construction of new facilities.
>
> 2. Integrate planned renewable generation resources[2], including up to 1,400 MW from the Ivanpah Dry Lake Area with a Power Purchase Agreement (PPA) executed by a California Public Utilities Commission (CPUC) jurisdictional Private Transmission Owners (PTO), in a manner that minimizes potential environmental impacts

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[92] Pub. Res. Code § 21082.1(c)(3); CEQA Guidelines § 15090.

[93] The below excerpt is from SCE's PEA (at 1-1 and 1-2) for "project objective." This language is different than the PEA "project objective" found in the EIR/EIS (at 1-8 at Section 1.2.1).

and impacts to existing and planned residences, where feasible, by maximizing the use of existing transmission corridors in order to:

a) maximize the use of existing, previously disturbed transmission line right-of-way (ROW) to minimize effect on previously undisturbed land and resources;

b) select route and tower locations with the lowest potential for environmental impacts while still meeting Proposed Project objectives; and

c) select the shortest feasible route that minimizes environmental impacts and Proposed Project costs.

3. Interconnect and deliver energy from up to 1,400 MW of renewable resources located in the Ivanpah Dry Lake Area in a way that complies with all applicable North American Electric Reliability Council (NERC)/Western Electric Coordinating Council (WECC) Planning Standards, and in a manner that minimizes transmission line crossings.

4. Support the State of California Greenhouse Gas Reduction Program.

5. Assist the BLM in meeting the federal directive to develop 10,000 MW of renewable generations.

5.1.2. The Project Objective

The Commission, together with the BLM, adopted the following objectives for the project:

Based on the content of the PEA and related federal and state objectives, the CPUC and the BLM have abridged the objectives for the proposed project to the following:

1. To connect renewable energy sources in the Ivanpah Valley area in compliance with Executive Order 13212, EPAct, the Federal

Power Act, California Senate Bill 1078, and California Senate Bill 107;

2. To improve reliability in compliance with applicable standards, including NERC, WECC, CAISO, and SCE standards; and

3. To maximize the use of existing ROW and designated utility corridors to minimize impacts on environmental resources. [94]

5.1.3. Project as a Whole

Both CEQA and NEPA stipulated that assessment is not limited to only the project components. Under CEQA, a "project" is defined as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment"[95] The Joint EIR/EIS incorporates the ISEGS project as part of the "whole of the action" and describes the relevant features of the ISEGS project found in the Final Staff Assessment/Draft EIR (FSA/DEIR) of the ISEGS project conducted by the CEC and the BLM.[96] The FSA/DEIS conclude that the ISEGS project would result in significant impacts.[97] Given the geographical proximity and the overlapping schedules of the Eldorado-Ivanpah Transmission Project, it is reasonable to assume that the Eldorado-Ivanpah Transmission Project, when

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[94] Joint FEIR/EIS at 1-11.

[95] CEQA Guidelines § 15378(a).

[96] CEC Application for Certification 07-AFC-5.

[97] Joint FEIR/EIS at 2-37.

considered in combination with ISEGS, would contribute cumulatively significant impacts.[98]

5.2. Applicant's Proposed Measures

Applicant's PEA proposes specific procedures to the project construction plans to minimize the environmental impact from the proposed project. These specific procedures are referred to as Applicant's Proposed Measures (APMs). The PEA's impact analysis assumes that the applicable APMs would be implemented to reduce air quality impacts. We adopt the APMs as part of our review of the proposed project and Applicant is required to comply with the APMs and the other mitigation measures contained in the Mitigation Monitoring, Reporting, and Compliance Program. The Commission shall monitor compliance with the Plan periodically throughout the duration of construction activities.

6. Certification of Final Joint EIR/EIS

The Commission must certify the Final Joint EIR/EIS. (CEQA Guidelines § 15090.)

We hereby certify that:

- The Final Joint EIR/EIS has been completed in compliance with CEQA.
- The Final Joint EIR/EIS was presented to the Commission, and the Commission has received, reviewed, and considered the information contained in the EIR/EIS prior to approving the project.

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[98] *Ibid.*

- The Joint Final EIR/EIS reflects the Commission's independent judgment and analysis.

7. CEQA Findings

Based upon the Joint Final EIR/EIS, we have prepared a set of CEQA Findings pursuant to CEQA Guidelines § 15091 regarding the significant impact associated with the proposed project. These findings are set forth in Attachment B to this decision. We find that the CEQA Findings accurately reflect the independent analysis contained in the Final Joint EIR/EIS and are supported by substantial evidence in the administrative record. We adopt them as Findings of Fact in this decision and incorporate them by reference herein.

7.1. CEQA - Environmentally Superior Alternative

CEQA imposes a general duty on public agencies to avoid or minimize, to the greatest extent possible, the environmental effects of projects they approve.[99] This duty generally is implemented by identifying and then adopting mitigation measures and/or alternatives to the project that will avoid or reduce environmental impacts.[100] To this end, CEQA requires that the Joint EIR/EIS identify an environmentally superior alternative among the alternatives evaluated.[101] There were 18 alternatives evaluated in the Joint FEIR/EIS. In

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[99] *County of San Diego v. Grossmont-Cuyamaca Community College Dist.* (2006) 141 Cal.App.4th 86, 98; Pub. Res. Code § 21002; 14 Cal. Code Regs. ("CEQA Guidelines") § 15021.

[100] Pub. Resources Code §§ 21100(b)(3), (4), 21003(c) [EIR should emphasize feasible mitigation measures and alternatives]; CEQA Guidelines §§ 15002(f), (h), 15126.4, 15126.6; *Laurel Heights Improvement Assn. v. The Regents of the University of California* (1988) 47 Cal.3d 376, 400-403.

[101] Joint FEIR/EIS at Section 4; CEQA Guidelines §§ 15126.6(a) and (e)(2).

contrast with the other routing and telecommunication alternatives evaluated in this Draft EIR/EIS, the proposed project would have less land disturbance and less significant impacts on sensitive biological resources, and it would meet all of the project's objectives.[102] Neither of the two remaining alternatives, which include the No Project alternative and the non-wires alternative, meets the project objectives. Therefore, the proposed route was determined to be the environmentally superior alternative among alternatives that would meet the Commission's project objectives as set forth in the Joint EIR/EIS.[103]

7.2. CEQA – Significant Environmental Effects, Statement of Overriding Consideration, and Rationale

Although the Environmentally Superior Alternative is the least environmentally damaging alternative, it does not mitigate all significant environmental impacts as described below and as further described in the Final Joint EIR/EIS. The whole of action, which includes the proposed Eldorado-Ivanpah Transmission Project as well as ISEGS, has significant and unavoidable adverse impacts on a number of areas including air quality, biological resources, land use, and visual resources. These impacts are summarized below.

Air Quality: Though impacts on air quality resulting from the whole of the action would not be long-term, the project would result in significant and unavoidable adverse impacts on air quality due to temporary emission increases of NOx, volatile organic compounds (VOCs), and PM10, associated with construction activities. These emissions would contribute to a cumulatively considerable net increase of a criteria pollutant in a non-attainment area, and

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[102] Joint FEIR/EIS at 4.7.

[103] *Ibid.*

temporary impacts on ambient air quality. As such the whole of the action/cumulative action will result in significant and unavoidable impacts to air quality.[104]

Biological Resources: The whole of the action would significantly and adversely affect biological resources, in particular resulting in unmitigable significant and unavoidable impacts to the desert tortoise. These impacts are caused primarily by construction activities of the two projects. Overall, the impacts on biological resources, with the notable exception of the impacts on the desert tortoise, from the whole of the action would be less than significant.[105]

Land Use: The whole of the action is found to have significant and unavoidable impacts on land use, largely resulting from the permanent conversion of habitat and recreational lands.[106]

Visual Resources: The whole of the action is found to have significant and unavoidable impacts on visual resources. The FSA for ISEGS project would result in significant and unavoidable visual impacts affecting the following viewer groups: the Primm Valley Golf Course, viewpoints in the Mojave National Preserve on the eastern face of Clark Mountain, and viewpoints in the Stateline Wilderness Area, including the Umberci Mine, and the middleground distance view on Highway I-15.[107] Additionally, the ISEGS project would result in lighting impacts for viewers in the Mohave National Preserve, because FAA safety lighting for the ISEGS project would result in an adverse and unavoidable impact on nighttime views. Collectively, then, the impact of the whole of the

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[104] Joint FEIR/EIS at 3.3-34.

[105] Joint FEIR/EIS at 3.4-127.

[106] Joint FEIR/EIS at 5-88.

[107] California Energy Commission (CEC) and Bureau of Land Management (BLM) 2009. Final Staff Assessment/Draft Environmental Impact Statement of the Ivanpah Solar Electric Generating System Project (CEC-700-2008-013-FSA). October Section 6.12, and California Energy Commission (CEC) 2010. Final Staff Assessment Addendum for the Ivanpah Solar Electric Generating System. March Section 6.

action on these viewers, including light impacts, would be significant and unavoidable. Importantly there are no feasible mitigation measure to reduce this impact to less than significant levels.[108]

7.3. Statement of Overriding Considerations

As explained above, the authorized Environmentally Superior Alternative and the combined Environmentally Superior Alternative and ISEGS project will have significant environmental impacts, a number of which cannot be mitigated. Therefore, the Commission must provide a statement of the overriding considerations pursuant to CEQA Guidelines § 15093. The Commission will not provide a statement of overriding consideration for the ISEGS project as this project has already been reviewed and certified.

The Commission recognizes that significant and unavoidable environmental impacts will result from construction and operation of the Environmentally Superior Alternative. Having: (1) adopted all feasible mitigation measures; (2) recognized all significant, unavoidable impacts; and (3) balanced the benefits of the Environmentally Superior Alternative against its significant and unavoidable impacts, the Commission hereby finds that the benefits of the project outweigh and override the significant unavoidable impacts for the reasons stated below. The Environmentally Superior Alternative will provide substantial benefits, including, but not limited to, facilitating California's renewable energy goals within a reasonable timeframe as well as advancing the state's efforts to reduce its carbon emissions consistent with Assembly Bill 32 (Stats. 2006, ch. 488).

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[108] Joint FEIR/EIS at 3.2-68 and 3.2-69

The Commission finds that the Environmentally Superior Alternative's unavoidable impacts are acceptable in light of these substantial benefits, which constitute an overriding consideration warranting approval of the project.

7.4. Mitigation Monitoring

The Final EIR/EIS includes a proposed Mitigation Monitoring Plan (Final EIR/EIS, Appendix E.) for the mitigation measures it recommends for the Proposed Project. The tables are presented in the Final EIR. These tables, along with the full text of mitigation measures applicable to the Environmentally Superior Alternative, form the Draft Mitigation Monitoring Plan. The plan is designed to ensure compliance with the changes in the project and mitigation measures imposed on the authorized project during implementation. It also recommends a framework for implementation of the Mitigation Monitoring Plan by this Commission and by BLM as the CEQA and NEPA Lead Agencies, respectively. We adopt the Mitigation Monitoring Plan.

8. Electric and Magnetic Fields

The Commission has examined the impact of electric and magnetic fields (EMF) in several previous proceedings.[109] The Commission found the scientific evidence presented in those proceedings was uncertain as to the possible health effects of electromagnetic fields and did not find it appropriate to adopt any related numerical standards. Because there is no agreement among scientists that exposure to EMF creates any potential health risk, and because CEQA does not define or adopt any standards to address the potential health risk impacts of

[109] D.06-01-042; D.93-11-013.

possible exposure to EMF, the Commission does not consider magnetic fields in the context of CEQA and determination of environmental impacts.

The Commission requires, pursuant to GO 131-D, that all requests for a CPCN include a description of the measures taken or proposed by the utility to reduce the potential for exposure to EMF generated by the proposed project. The Commission developed an interim policy that requires utilities, among other things, to identify the no-cost measures undertaken, and the low-cost measures implemented, to reduce the potential EMF impacts. The benchmark established for low-cost measures is 4% of the total budgeted project cost that results in an EMF reduction of at least 15% (as measured at the edge of the utility right-of-way). SCE's Field Management Plan, included at Exhibits SCE-3 and incorporated into the design of the proposed project, addresses the EMF mitigation measures that will be taken in connection with the proposed project.

We adopt SCE's Field Management Plan for the proposed project and require SCE to comply with it.

9. Costs

SCE has provided sufficient evidence to support its cost estimate for the project, including SCE's preliminary total estimated costs—excluding Allowance for Funds Used During Construction (AFUDC) costs for the proposed route and all alternatives, as required by Pub. Util. Code § 1005.5(a).[110] With the exception of AFUDC, all cost estimates are provided in 2009 constant dollars. In addition, SCE's cost estimating methodology is appropriate. Consistent with Commission practice, SCE did not include AFUDC costs for purposes of estimating the total

[110] Exhibit SCE-1 (Chien) at 12.

maximum reasonable and prudent costs. It is also appropriate for SCE to use deflation factors to convert actual expenditures in future years to their equivalent value in 2009 dollars.

As part of SCE's direct costs estimate, SCE incorporates the costs associated with complete redundancy for the Special Protection System (SPS).[111] The SPS system includes a primary telecommunications line that will run along the new 220 kV line and a second telecommunications line, the redundant line, that will traverse approximately 35 miles in California and Nevada. The redundant telecommunications line is referred to as Telecom Path 2. Telecom Path 2 would be built along the existing SCE 500 kV Eldorado-Lugo transmission line and transmitted via microwave facilities.[112]

SCE explains that the Telecom Path 2 is strongly encouraged by the North American Electric Reliability Corporation (NERC)/Western Electricity Coordinating Council (WECC) Planning Standards but also indicates that "precontingency generation curtailment" might be an alternative to the additional line.[113] DRA argues that Telecom Path 2 is not needed and, as a result, the costs should be excluded.[114] DRA's arguments points to generation curtailment or load shedding as a reasonable and acceptable alternative to construction of Telecom Path 2.[115]

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[111] Exhibit SCE-1 at 12.

[112] Joint FEIR/EIS at 2-35.

[113] SCE Reply Brief at 20.

[114] DRA Opening Brief at 4 and Reply Brief at 2.

[115] DRA Opening Brief at 4-5.

In contrast to DRA, SCE states that the SPS is critical to enabling the Eldorado-Ivanpah Transmission Project to be fully utilized.[116] SCE argues that because the SPS only disconnects renewable resource under abnormal conditions, which, by definition are rare, the SPS ensures the ability of the line to be fully utilized during normal operating conditions. SCE has adequately demonstrated the prudency of the Special Protection Systems and its consistency with CAISO planning standards and NERC/WECC planning standards.

Regarding SCE's proposed contingency, it suggests a 35% contingency, citing to SCE's recent experience with the Antelope-Pardee Transmission Project 1 (Antelope 1) and Antelope-Pardee Transmission Project 2 and 3 (Antelope 2 and 3).[117] SCE further suggests that the amount of contingency as a percentage of the cost estimate will decrease as the project scope is better defined. SCE's requested contingency exceeds the amounts, generally between 5% and 15%, recently adopted by the Commission and requested by applicants for similar transmission projects in California.[118] Consistent with precedent, we adopted a contingency of 15%.[119] This contingency will be applied to the total project costs of $306.338 million, as noted at Exhibit SCE-1.

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[116] SCE Reply Brief at 20-22.

[117] SCE Opening Brief at 30.

[118] DRA Opening Brief at 13.

[119] D.09-12-044 at 69-71.

SCE also requests that the Commission find that its preliminary cost estimates of $306 million (constant 2009 dollars), excluding contingency and corporate overhead,[120] qualify as reasonable and prudent under California Public Utilities Code Section 1005.5(a). This "reasonable amount" is sometimes referred to as a "cost cap."[121] In the future, if circumstances warrant, SCE would request the Commission to consider an appropriate request from SCE for an increase of the reasonable and prudent cost cap pursuant to Section 1005.5(b). We adopt as reasonable a cost cap under § 1005.5 the total amount noted in Attachment A to Exhibit SCE-1, direct costs of $306.338 million plus a 15% contingency.

10. Public Utilities Section 625 Notice Requirements

SCE states it will comply with the applicable notice requirements in California Public Utilities Code Section 625, should SCE become aware of any need to condemn property for competitive purposes during this process. We affirm that SCE must comply with Section 625 as needed.

11. Comment Period

The alternate proposed decision of the Commissioner in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments on the Proposed Decision and Alternate Proposed Decision were filed on December 6, 2010 by Southern California Edison, jointly by Brightsource and First Solar, the Division of Ratepayer Advocates, the Center for Biological Diversity, and Western Watersheds Project,

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[120] Exhibit SCE-1 at 19.

[121] Exhibit SCE-1 at 20:7-8.

and reply comments were filed on December 13, 2010 by Southern California Edison, jointly by Brightsource and First Solar, the Center for Biological Diversity, and the Division of Ratepayer Advocates.

SCE's comments focused primarily on the Proposed Decision which denies the SCE's application. In particular, SCE argues that the requirement implied by the PD, that available capacity on the transmission systems of other transmission providers must be fully evaluated before a CPCN can be granted, is unduly burdensome and would, if adopted create a significant barrier to renewable development. SCE notes in particular that neither SCE nor CAISO can conduct system impact studies to evaluate the affect of interconnecting renewables to third party transmission systems, like LADWP and NV Energy, both of which own high voltage transmission in the vicinity of the proposed project. Similarly, SCE notes the CPUC has no authority to compel these entities to conduct such studies. Lastly, on this point, SCE argues that the approach taken in the PD would force generators to pursue interconnection studies with multiple transmission system providers in a given region, dramatically increasing the time, cost and uncertainty associated with the interconnection process. To the extent projects are able to interconnect, it will lead to a piecemeal solution and upgrades to the transmission system to facilitate renewable compliance, contrary to the intent of § 399.2.5. SCE disputes the PD's finding that the line is not needed based on the speculative nature of the projects that would use the line if built. SCE also argues that the PD's characterization of Desert Tortoise fragmentation is incorrect. In light of these arguments SCE supports the Alternate Proposed Decision.

Brightsource and First Solar also support the APD and make many similar arguments as those of SCE regarding the PD. Brightsource and First Solar argue

that the PD strays from the intent of the § 399.2.5 by introducing a new standard/requirement for approval, namely requiring SCE to analyze available capacity on non-CPUC jurisdictional transmission systems, which creates additional project development barriers rather than facilitating renewable development. This, in their view, also conflicts with the SCE's obligations pursuant to the CAISO tariff and the Federal Power Act, namely that SCE take the appropriate steps to interconnect these resources when interconnection is requested. They further argue that the approach proposed in the PD is impractical given the fact that these third-party facilities are not subject to these requirements, creating a great deal of uncertainty in the interconnection process. Brightsource and First Solar suggest that the PD conflicts with Commission precedent noting that the approach in the PD regarding third party transmission system capacity was not imposed in the case of decisions granting CPCNs for Tehachapi segments 1-3 and Tehachapi segments 4-11. Because the PD would essentially force developers to engage in multiple interconnection processes, Brightsource and First Solar allege it would dramatically increase the regulatory burden to transmission development to the detriment of project developers. In the case of this application in particular, denying the CPCN will adversely impact the ability of Brightsource to move forward because it creates uncertainty as to how and if Brightsource will be able to interconnect thus putting at risk the commercial arrangements between Brightsource and DOE which are largely contingent on the timely approval of EITP.

DRA supports the PD denying the application and opposes the APD. DRA supports the approach taken in the PD, in particular agreeing that because there may be sufficient capacity on existing transmission systems in the region to deliver energy from the Brightsource project it is unnecessary and premature to

grant the CPCN for EITP. DRA also argues that the other projects with approved PPAs and the potential in the region is too uncertain to be used to justify the line or meet the criteria established for making a need determination pursuant to § 399.2.5.

DRA goes on to argue that because, in its view, the necessity of the line to deliver renewable energy pursuant to the first two prongs of the three prong test is suspect, the requirement that the costs of the line be reasonably balanced against the potential to achieve economically rational RPS compliance cannot be met.

DRA also raises a number of technical concerns with the proposed project noting that no CAISO study has been performed on the EITP as a whole, and the system impact study that has been done is, in DRA's view, grossly flawed. They also note that CAISO has not approved the project as a whole, and lastly, DRA argues that there has been insufficient consideration of Alternatives, in particular, a westward path alternative.

In its comments, CBD agrees with the PD that the applicant has failed to demonstrate that the project is needed. In particular, CBD agrees with the PD's conclusion that because there may be sufficient transmission capacity on other transmission providers' systems to interconnect the "one permitted project and the one project with an approved PPA" there is insufficient basis to conclude that the project is needed. CBD presents information regarding the existing transmission facilities in the region and presents information indicating that there is substantial capacity on LADWP's system to interconnect resources. CBD also presents cost information regarding the relatively lower cost of interconnecting to LADWP's system than building EITP. CBD also argues that because the line cannot be guaranteed to only carry renewables, especially given

the, in CBD's view, highly speculative nature of renewable projects that would utilize EITP and the fact that SCE did not provide data on its compliance with the RPS, it should not be approved.

CBD also reiterates a number of arguments regarding the insufficiency of the Final EIR/EIS. Regarding the Peevey APD specifically, CBD argues that the APD is trying to have it both ways; accepting the approach taken in the EIR in which a number of projects were deemed too speculative to be included in the CEQA review, but viewing these same projects as sufficiently certain to warrant finding the line is needed in order to interconnect them. Western Watersheds Project focused on alleged deficiencies in the final environmental document.

Most of the arguments raised in comments are squarely addressed in the discussion above providing our rationale for approving this project. While a number of parties oppose approval on the grounds that the resource potential and the renewable projects that would interconnect to EITP are too speculative, we flatly disagree. The approved PPAs in the region combined with the projects in the CAISO queue and the resource potential identified in the region provide a compelling basis to determine that this line, when built, will interconnect a substantial amount of renewable energy that would otherwise go undelivered, and thus can play an instrumental role in achieving the state's renewable energy goals.

We also won't belabor the discussion regarding whether the potential availability of transmission capacity on other entities' systems provides a basis for rejecting the CPCN. As SCE as well as Brightsource and First Solar point out, denying a project on the grounds that there might be transmission capacity available on non-CAISO transmission systems introduces substantial uncertainty into the interconnection process by effectively requiring project developers to

pursue multiple interconnection requests with various transmission owners in a region. This approach also creates tremendous uncertainty for transmission owners, like SCE, which are subject to the CAISO tariffs in that there is not currently a means by which they can assess available capacity on other systems before submitting an application for a CPCN as they, CAISO, nor this Commission, have the authority or other means of facilitating the level of coordination this would require. Additionally, the information CBD provides in its comments regarding the availability and economics of transmission capacity on LADWP's system is new information and is not part of the evidentiary record in this proceeding.

DRA's arguments regarding the insufficiency of the CAISO impact studies do not provide a compelling basis to deny or postpone approval of the CPCN. Though we do not dispute the basic fact that the system impact studies conducted thus far evaluated the system impacts below the line's full proposed capacity for generator interconnection, we note that additional generation projects seeking to use the line in the future will need to undertake studies before being interconnected to ensure that doing so will not result in adverse system impacts, pursuant to CAISO Tariff Appendix Y -LGIP For Requests In A Queue Cluster Window.[122] This is a less than ideal approach in that such subsequent generator interconnections might require further upgrades somewhere on the network in order to maintain reliability and deliverability, affecting the economic and environmental consequences of the overall transmission project in ways not assessed in the limited interconnection studies that have been presented. Such

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[122] See CAISO Tariff Appendix Y,http://www.caiso.com/27c3/27c3ee0763210.pdf.

further assessment would appear to require some speculation regarding the specific nature of the generation projects that will ultimately use the line, but would provide valuable information for assessing the full transmission project. However, given urgent circumstances in the present case combined with evidence regarding further renewable resources and commercial activity in this area, suspending consideration of this line pending an additional system impact study that evaluates the potential impacts if the line is used to its full rated capacity will lead to unacceptable delays. We believe the approach taken here, coupled with the interconnection protocols to which projects seeking to use this line are subject, provide adequate safeguards to prevent adverse system impacts due to full subscription of the line's capacity while ensuring that the near term projects that will interconnect can do so safely and without negatively effecting grid reliability.

With respect to DRA's concerns regarding how CAISO approval of the line occurs, in general we agree that under ideal circumstances major projects like EITP would emerge from the CAISO's overall integrated Transmission Planning Process (TPP) which provides a more holistic and open forum, and a more transparent basis, to consider and compare the various transmission lines that could be built to access high-potential renewable resource areas. However, we also recognize the practical reality that the timing for that integrated process does not currently align well with the exigencies of developing the substantial initial round of renewable projects in the Ivanpah Valley Region, particularly given the availability and terms of federal funding like the DOE loan guarantees. In this case, a number of relatively advanced renewable projects have sought interconnection to SCE's system via the Large Generator Interconnect Procedures and the line is being proposed, and a CPCN being requested in response to those

interconnection requests but additionally recognizing that from an economic standpoint, the line should be efficiently sized to support an amount of renewable generation that we can realistically anticipate being developed in the region in the not-too-distant future, to avoid piecemeal infrastructure development. For these reasons we disagree with the DRA's position that we should wait for relevant action from the CAISO's TPP, or its proposed revised TPP (RTPP) before considering this project. We also note that DRA's contention, that the CAISO has not approved this line, is misleading. While the project did not come out of the TPP, CAISO did enter into Large Generator Interconnection agreements that require SCE to pursue EITP.

However, having said that, use of the narrower generator interconnection process to design and implicitly approve (when LGIAs are submitted to FERC) very large transmission projects costing hundreds of millions of dollars and sized well beyond current generator interconnection needs is not a desirable alternative to studying, planning and approving such projects through the more holistic, transparent and open TPP. This is especially true when we are seeing high cost estimates, when more such renewable generation-supporting projects are anticipated, and when we have already expressed support for competitive opportunities to develop such transmission.

With respect to DRA's concerns regarding the elimination of westward alternatives from consideration, we believe the appropriate forum for this issue was in the context of the EIR/EIS. The determination to exclude the westward alternative was made in that context and parties were given full opportunity to participate in that process. We do not believe we need to readdress the basis for the determination of which alternatives were carried forward here. Similarly, to the extent Western Watersheds Project raises concerns in its comments related to

the insufficiency of the EIR/EIS we believe those issues are addressed in the Final EIR/EIS which we certify in this decision, and do not need to be further addressed here.

Regarding CBD's argument that the projects the Commission relies on to justify a need determination for EITP should also be incorporated into the EIR/EIS, we are not persuaded. This argument implies that the standard for determining need under § 399.2.5 requires that the renewable projects that support such a finding be sufficiently advanced for inclusion as a connected action in the CEQA context. However, no such equivalency is required. For example, the substantial renewable resource potential of an area could reasonably serve as the basis to find that a given transmission project is necessary to facilitate economically rational development for achieving the goals of the RPS program consistent with § 399.2.5. In our view, including as connected actions various hypothetical projects that may emerge is not required in the CEQA review. These projects were not sufficiently advanced to merit inclusion in the EIR/EIS. In addition, CBD's reasoning ignores the fact that the EIR/EIS is developed in a dynamic environment which can change while the review is being conducted and finalized. Those projects that were sufficiently advanced at the time the scope and baselines were established for conducting the environmental review should be included in the EIR/EIS, however this represents a subset of the projects that may be considered in making a need determination pursuant to § 399.2.5. This is driven both by the relative breadth of what projects and resources are considered in making a need determination, under § 399.2.5, recognizing our desire to build transmission in a manner that anticipates future development, as well as the fact that our consideration of the CPCN necessarily occurs after a substantial amount of time has passed since the

EIR/EIS process was initiated. As result of this, projects that were not well-defined when the scope and baselines were set for the EIR/EIS have since become more defined. However, as a practical and legal matter we are not obligated to include these emerging projects in the EIR/EIS. To do so would lead to a potentially open-ended environmental review process. The EIR/EIS conducted for this project appropriately included those projects that were sufficiently advanced at the time to be incorporated into the environmental review. In contrast, the need determination under § 399.2.5 considered a much broader set of projects including those projects that were well-defined at the time the environmental review was initiated, those projects that have since that time become relatively more well defined, as well as projects that are less mature, but which still reflect and validate the extensive renewable resource potential in the area, as well as the commercial interest in developing that potential in the region.

12. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner and Regina M. DeAngelis is the assigned ALJ in this proceeding.

Findings of Fact

1. The Eldorado-Ivanpah Transmission Project is necessary to promote the safety, health, comfort, and convenience of the public.

2. The Eldorado-Ivanpah Transmission Project is a high-voltage, bulk transfer, transmission facility designed to serve multiple renewable projects in the Ivanpah Dry Lake region.

3. The transmission capacity on the CAISO system that is currently available to interconnect resources in the Ivanpah Dry Lake Area is approximately 80 MW.

4. As proposed, the Eldorado-Ivanpah Transmission Project would provide sufficient transfer capability to transmit up to 1,400 MW of renewable capacity.

5. At present there are four renewable energy projects, representing 717 MW of capacity, with Commission approved power purchase agreements that are seeking interconnection to the CAISO system in the Ivanpah Dry Lake Area.

6. These power purchase agreements were approved in part because of the role that deliveries from these projects are anticipated to play in the realization of the state's 20% RPS goals.

7. At present there are 6 projects representing 964 MW of capacity requesting interconnection to the Eldorado-Ivanpah Transmission Project CAISO interconnection queue.

8. RETI identified the Mountain Pass Competitive Renewable Energy Zone, which is located in the California portion of the Ivanpah Dry Lake Area, as having significant renewable potential, in excess of 950 MW of potential capacity.

9. The Renewable Energy Transmission Initiative also identified an additional 5,402 MW of renewable capacity in the Nevada Southwest.

10. In light of the limited existing available transmission capacity on SCE's system, absent the Eldorado-Ivanpah Transmission Project, the renewable generation projects with Commission approved power purchase agreements will not have a means to deliver their energy to load centers, and, as a result, would be subject to significant delay and risk of contract failure.

11. The Eldorado-Ivanpah Transmission Project may play an important role in the development of renewable resources in the Ivanpah Dry Lake Area beyond those projects with Commission approved power purchase agreements.

12. Once an interconnection request is submitted to the CAISO, numerous studies are required before an interconnection agreement can be reasonably executed.

13. The time between submission of an interconnection request and execution of and interconnection agreement takes approximately two years.

14. The cost of the Eldorado-Ivanpah Transmission Project is justified based upon the high degree of the certainty that the project is needed to ensure development of RPS-eligible resources in the Ivanpah Dry Lake Area.

15. The project alternatives considered in the Final EIR/EIS constitute a reasonable range of feasible alternatives, as required by the CEQA Guidelines.

16. The environmentally superior alternative for the Eldorado-Ivanpah Transmission Project as identified in the Final EIR is the applicant's proposed project.

17. The environmentally superior route poses less harm to the environment than do the other routes proposed by SCE and/or considered in the Final EIR/EIS, while still meeting the project objectives.

18. The proposed route includes no-cost and low-cost measures (within the meaning of D.93-11-013, and D.06-01-042) to reduce possible exposure to EMF.

19. SCE agrees to comply with the mitigation measures described in the Final EIR/EIS.

20. The Commission has reviewed and considered the information in the Final EIR/EIS before approving the project.

21. In determining whether to grant a CPCN for the proposed project, we have given express consideration to community values, recreational and park areas, historic and aesthetic values, and influence on the environment.

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22. The Final EIR identifies significant environmental effects of approved route that can be mitigated or avoided such that they become not significant.

23. Specific findings with respect to all significant or potentially significant environmental effects of the project as proposed and of the various alternative routes studied in the Final EIR/EIS are set forth in Attachment B to this Decision, CEQA Findings of Fact. We adopt the CEQA Findings of Fact included in Attachment B as if fully set forth herein.

24. The environmental mitigation measures identified in the Final EIR/EIS, and set forth in detail in Attachment A to this Decision, are feasible and will avoid some of the significant environmental impacts that would otherwise result from the approved project.

25. The Mitigation Monitoring Plan set forth in Chapter 9 of the Final EIR/EIS conforms to the recommendations of the Final EIR/EIS for measures required to mitigate or avoid those environmental effects of the project that can be reduced or avoided.

26. Notwithstanding the adoption in this Decision of all feasible mitigation measures identified in the Final EIR/EIS, and set forth in detail in Attachment A, there are certain adverse environmental impacts of the project being approved in this decision that cannot mitigated to a less than significant level. The project's unavoidable adverse environmental impacts are acceptable in light of the substantial benefits the project provides, particularly its role in facilitating compliance with the state's Renewables Portfolio Standard and meeting the greenhouse gas mitigation goals pursuant to Assembly Bill 32, which constitute an overriding consideration warranting approval of the project, despite each and every unavoidable impact.

27. As the State's lead agency under CEQA, the Commission is required to monitor the implementation of mitigation measures adopted for this project to ensure full compliance with the provisions of the monitoring program.

28. The Commission will develop a detailed implementation program for the Mitigation Monitoring Plan. This program will be called the Mitigation Monitoring, Reporting and Compliance Program (MMRCP).

29. The Final EIR reflects the Commission's independent judgment and analysis.

Conclusions of Law

1. The Commission has jurisdiction over the proposed project pursuant to, inter alia, Pub. Util. Code §§ 399.25 and §§ 1001 et seq.

2. In order to award a certificate under § 1001, the Commission must find that the present or future public necessity require or will require construction of the line.

3. Section 399.2.5 authorizes the Commission to deem necessary those transmission facilities identified in applications if the proposed facilities are necessary to facilitate achievement of the State's renewable power goals.

4. Section 399.2.5 also provides a "backstop" cost mechanism allowing the utilities to recover through retail rates any prudently incurred costs that are not approved by the Federal Energy Regulatory Commission for recovery through transmission rates.

5. The Commission implemented the cost recovery provisions of § 399.2.5 in D.03-07-033 and in D.06-06-034.

6. Section 399.2.5 does not create a presumption of need and the authority under § 399.2.5 is only exercised *after* the Commission fully considers the requirements of §§ 1001-1013, including the analysis required by § 1002.

7. Section 399.2.5 recognizes that in order to achieve RPS goals, it may be necessary for the Commission to approve new transmission projects in anticipation of future renewable energy projects, and to provide additional assurances of recovery of reasonable construction costs.

8. Because § 399.2.5 exists in a broader statutory context – one that requires ambitious renewable portfolio development, reasonable rates, and environmental protection -- we interpret this code section in a manner that strikes a reasonable balance.

9. In D.06-06-034 we identified two types of transmission projects that could be needed to facilitate RPS compliance and were therefore eligible for cost recovery. Those projects included "high-voltage, bulk-transfer, multi-user transmission facilities… proposed to access known, concentrated renewable resource areas…"

10. D.06-06-034 also noted that the degree of certainty required for a showing of RPS need "will depend on the magnitude of costs at stake," and that "in certain cases it will be necessary to consider the status of the RPS compliance to date…"

11. In order to rely on § 399.2.5 to establish the need for a project, we find that a proponent must demonstrate: (1) that a project would bring to the grid renewable generation that would otherwise remain unavailable; (2) that the area within the line's reach would play a critical role in meeting the RPS goals; and (3) that the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance.

12. The Eldorado-Ivanpah Transmission Project satisfies the requirements of Pub. Util. Code § 399.2.5.

13. The Commission retains authority to approve SCE's EMF mitigation plan to ensure that it does not create other adverse environmental impacts.

14. The Final EIR/EIS should be approved.

15. Project approval should be conditioned upon the completion of the mitigation measures set forth in Attachment A. These mitigation measures are feasible and will minimize or avoid significant environmental impacts. Those mitigation measures should be adopted and made conditions of project approval.

16. After considering and weighing the values of the community, the impacts to parks and recreational areas, the impacts on historical and aesthetic values, and the environmental impacts caused by the project, we conclude that the CPCN for the Eldorado-Ivanpah Transmission Project as described in this decision should be approved.

17. The Commission is the Lead Agency for compliance with the provisions of CEQA.

18. The Draft EIR/EIS analyzing the environmental impacts of the Proposed Project was processed in compliance with CEQA.

19. A Final EIR/EIS on the Proposed Project was processed and completed in compliance with the requirements of CEQA.

20. The Draft EIR/EIS and the Final EIR/EIS (which includes the Mitigation Monitoring, Reporting and Compliance Program and EMF Field Management Plan) should be adopted in their entirety.

21. SCE should be granted CPCN for the proposed route of the Eldorado-Ivanpah Transmission Project, with mitigation set forth in the Mitigation Monitoring Plan.

22. SCE should obtain all necessary permits, easement rights or other legal authority for the project site prior to commencing construction.

23. Possible exposure to EMF has been reduced by the no-cost and low-cost measures SCE will include in the project that are specified in Appendix B of its Application and pursuant to D.93-11-013, and D.06-01-042.

24. SCE's EMF management plan for the Eldorado-Ivanpah Transmission Project is adopted.

25. Based on the completed record before us, we conclude that other alternatives identified in the Final EIR/EIS are infeasible or and/pose more significant environmental impacts than the route we select in this decision.

26. Section 399.2.5(b)(4) ensures retail rate recovery of prudently-incurred costs for projects the Commission finds to be necessary to facilitate RPS compliance to the extent that cost recovery is not otherwise available.

27. The determinations made in D.06-06-034 regarding implementation of the cost recovery provisions of § 399.2.5 apply here.

28. Section 399.2.5 requires the Commission to direct SCE to seek the recovery through general transmission rates of the costs associated with the transmission facilities.

29. Section 399.25 is not meant to substitute for the existing cost recovery mechanisms available to support transmission development, nor is it intended to change the ultimate cost responsibility of generators and utility ratepayers. Nothing in this decision is intended to relieve renewable generators from their responsibility for their fair share of the costs of non-network transmission facilities necessary to interconnect the generator with the network.

30. Notwithstanding the likelihood of cost recovery through FERC wholesale rates, it is appropriate for SCE to continue to track its project costs through the

memorandum account approved by the Commission on December 17, 2009 in response to SCE Advice Letter 2345-E on December 17, 2009.

31. Both § 399.2.5 and D.06-06-034 anticipate that first FERC would act, and that this Commission would step in only if FERC disallows recovery of some costs. Thus, any consideration of cost recovery by this Commission would only come after FERC had concluded its consideration of cost recovery for the project.

32. The Commission has authority to specify a "maximum cost determined to be reasonable and prudent" for the Eldorado-Ivanpah Transmission Project pursuant to Pub. Util. Code § 1005.5.

33. The Commission should approve a maximum reasonable and prudent cost cap under § 1005.5 of $306.338 million plus a 15% contingency for this project.

34. Commission approval of SCE's application, as modified herein, is in the public interest.

35. This order should be effective immediately so that construction of the project can begin.

36. Application 09-05-027 should be closed.

O R D E R

IT IS ORDERED that:

1. A Certificate of Public Convenience and Necessity is granted to Southern California Edison Company to construct the Eldorado-Ivanpah Transmission Project, following the environmentally superior route described in the Final Joint Environmental Impact Report/Environmental Impact Statement, including the Draft and the Final Joint Environmental Impact Report/Environmental Impact Statement Mitigation Monitoring Plan and the Electric and Magnetic Fields Field Management Plan.

2. Southern California Edison Company shall, as a condition of approval, comply with all applicably mitigation measures specified in the Final Environmental Impact Report/Environmental Impact Statement and as directed by the Commission's Executive Director or designee(s). Southern California Edison Company shall work with the Commission's Energy Division to create detailed maps for use in construction and mitigation monitoring.

3. The Mitigation Monitoring Plan included as part of the Final Environmental Impact Report is adopted.

4. Pursuant to Pub. Util. Code § 1005.5(a), the maximum cost cap (in 2009 dollars) determined to be reasonable and prudent for the Eldorado-Ivanpah Project, is $306.338 million plus a 15% contingency.

5. The Energy Division shall supervise and oversee construction of the project insofar as it relates to monitoring and enforcement of the mitigation measures described in the Final Joint Environmental Impact Report/Environmental Impact Statement in accordance with the Mitigation Monitoring Plan set forth in Chapter 9 of the Final Joint Environmental Impact Report/Environmental Impact Statement. The Energy Division may delegate its duties to one or more Commission staff members or outside staff. The Energy Division is authorized to employ staff independent of the Commission staff to carry out such functions, including, without limitation, the on-site environmental inspection, environmental monitoring, and environmental mitigation supervision of the construction of the project. Such staff may be individually qualified professional environmental monitors or may be employed by one or more firms or organizations. In monitoring the implementation of the environmental mitigation measures described in the Final Joint Environmental Impact Report/Environmental Impact Statement, the Energy Division shall

attribute the acts and omissions of Southern California Edison Company's employees, contractors, subcontractors, or other agents to Southern California Edison Company. Southern California Edison Company shall comply with all orders and directives of the Energy Division concerning implementation of the environmental mitigation measures described in the Joint Environmental Impact Report/Environmental Impact Statement.

6. The Energy Division shall supervise and oversee the construction of the Eldorado-Ivanpah Transmission Project insofar as it relates to monitoring and enforcement of the mitigation measures described in the Final Environmental Impact Report/Environmental Impact Statement. The Energy Division may designate outside staff to perform on-site monitoring tasks. The Commission project manager (Energy Division, Environmental Projects Unit) shall have the authority to issue a Stop Work Order on the entire project, or portions thereof, for the purpose of ensuring compliance with the mitigation measures described in the Final Environmental Impact Report/Environmental Impact Statement. Construction may not resume without a Notice to Proceed issued by the Environmental Projects Unit of the Energy Division.

7. Southern California Edison Company's right to construct the Eldorado-Ivanpah Transmission Project as set forth in this decision shall be subject to all other necessary state and local permitting processes and approvals.

8. Southern California Edison Company shall file a written notice with the Commission, served on all parties to this proceeding, of its agreement, executed by an officer of Southern California Edison Company duly authorized (as evidenced by a resolution of its board of directors duly authenticated by a secretary or assistant secretary of Southern California Edison Company) to acknowledge Southern California Edison Company's acceptance of the

conditions set forth in the Ordering Paragraphs of this decision. Failure to file such notice within 75 days of the effective date of this decision shall result in the lapse of the authority granted by this decision.

9. Consistent with Pub. Util. Code § 399.2.5, the Commission shall ensure that Southern California Edison Company is eligible to recover, through rates, any reasonable and prudent costs related to the Eldorado-Ivanpah Transmission Project that the Federal Energy Regulatory Commission determines not to reflect in authorized transmission rates. Southern California Edison Company shall account for these costs, and seek any needed future recovery, in the manner described in Section 4.4.2 of this decision.

10. The Final Environmental Impact Report/Environmental Impact Statement for the Eldorado-Ivanpah Transmission Project is certified pursuant to the requirements of the California Environmental Quality Act, Public Resources Code §§ 21000 et seq.

11. The Draft Environmental Impact Report/Environmental Statement and the Final Environmental Impact Report/Environmental Statement are received into evidence. These documents are Exhibits ALJ-1 and 2 respectively.

12. The Energy Division shall file a Notice of Determination for the project as required by the California Environmental Quality Act and the regulations promulgated pursuant thereto.

13. Upon satisfactory completion of the project, Southern California Edison Company shall file a notice of completion with the Executive Director by the Energy Division.

14. Application 09-05-027 is closed.

This order is effective today.

Dated December 16, 2010, at San Francisco, California.

MICHAEL R. PEEVEY
President
DIAN M. GRUENEICH
JOHN A. BOHN
TIMOTHY ALAN SIMON
NANCY E. RYAN
Commissioners

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Appendix 7
Appeals Process (ROW- IBLA)

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Form 1842-1
(April 2006)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

INFORMATION ON TAKING APPEALS TO THE INTERIOR BOARD OF LAND APPEALS

DO NOT APPEAL UNLESS
1. This decision is adverse to you,
AND
2. You believe it is incorrect

IF YOU APPEAL, THE FOLLOWING PROCEDURES MUST BE FOLLOWED

1. NOTICE OF APPEAL.....

A person served with the decision being appealed must transmit the *Notice of Appeal* in time for it to be filed in the office where it is required to be filed within 30 days after the date of service. If a decision is published in the FEDERAL REGISTER, a person not served with the decision must transmit a *Notice of Appeal* in time for it to be filed within 30 days after the date of publication (43 CFR 4.411 and 4.413).

2. WHERE TO FILE
NOTICE OF APPEAL.....

NEEDLES FIELD OFFICE
1303 SOUTH U.S. HIGHWAY 95
NEEDLES, CA 92363

WITH COPY TO
SOLICITOR...

OFFICE OF THE REGIONAL SOLICITOR, PACIFIC SOUTHWEST REGION
2800 COTTAGE WAY, ROOM E-1712S
SACRAMENTO, CA 95825-1890

3. STATEMENT OF REASONS

Within 30 days after filing the *Notice of Appeal*, file a complete statement of the reasons why you are appealing. This must be filed with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. If you fully stated your reasons for appealing when filing the *Notice of Appeal*, no additional statement is necessary (43 CFR 4.412 and 4.413).

WITH COPY TO
SOLICITOR.....

OFFICE OF THE REGIONAL SOLICITOR, PACIFIC SOUTHWEST REGION
2800 COTTAGE WAY, ROOM E-1712S
SACRAMENTO, CA 95825-1890

4. ADVERSE PARTIES.....

Within 15 days after each document is filed, each adverse party named in the decision and the Regional Solicitor or Field Solicitor having jurisdiction over the State in which the appeal arose must be served with a copy of: (a) the *Notice of Appeal*, (b) the Statement of Reasons, and (c) any other documents filed (43 CFR 4.413). If the decision concerns the use and disposition of public lands, including land selections under the Alaska Native Claims Settlement Act, as amended, service will be made upon the Associate Solicitor, Division of Land and Water Resources, Office of the Solicitor, United States Department of the Interior, Washington, D.C. 20240. If the decision concerns the use and disposition of mineral resources, service will be made upon the Associate Solicitor, Division of Mineral Resources, Office of the Solicitor, United States Department of the Interior, Washington, D.C. 20240.

5. PROOF OF SERVICE.....

Within 15 days after any document is served on an adverse party, file proof of that service with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. This may consist of a certified or registered mail "Return Receipt Card" signed by the adverse party (43 CFR 4.401(c)).

6. REQUEST FOR STAY.....

Except where program-specific regulations place this decision in full force and effect or provide for an automatic stay, the decision becomes effective upon the expiration of the time allowed for filing an appeal unless a petition for a stay is timely filed together with a *Notice of Appeal* (43 CFR 4.21). If you wish to file a petition for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Interior Board of Land Appeals, the petition for a stay must accompany your *Notice of Appeal* (43 CFR 4.21 or 43 CFR 2801.10 or 43 CFR 2881.10). A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the *Notice of Appeal* and Petition for a Stay **must** also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay. Except as other provided by law or other pertinent regulations, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards: (1) the relative harm to the parties if the stay is granted or denied, (2) the likelihood of the appellant's success on the merits, (3) the likelihood of immediate and irreparable harm if the stay is not granted, and (4) whether the public interest favors granting the stay.

Unless these procedures are followed, your appeal will be subject to dismissal (43 CFR 4.402). Be certain that **all** communications are identified by serial number of the case being appealed.

NOTE: A document is not filed until it is actually received in the proper office (43 CFR 4.401(a)). See 43 CFR Part 4, subpart b for general rules relating to procedures and practice involving appeals.

(Continued on page 2)

43 CFR SUBPART 1821--GENERAL INFORMATION

Sec. 1821.10 Where are BLM offices located? (a) In addition to the Headquarters Office in Washington, D.C. and seven national level support and service centers, BLM operates 12 State Offices each having several subsidiary offices called Field Offices. The addresses of the State Offices can be found in the most recent edition of 43 CFR 1821.10. The State Office geographical areas of jurisdiction are as follows:

STATE OFFICES AND AREAS OF JURISDICTION:

Alaska State Office ---------- Alaska
Arizona State Office --------- Arizona
California State Office ------- California
Colorado State Office -------- Colorado
Eastern States Office --------- Arkansas, Iowa, Louisiana, Minnesota, Missouri and, all States east of the Mississippi River
Idaho State Office ------------ Idaho
Montana State Office --------- Montana, North Dakota and South Dakota
Nevada State Office ---------- Nevada
New Mexico State Office ---- New Mexico, Kansas, Oklahoma and Texas
Oregon State Office ---------- Oregon and Washington
Utah State Office ------------- Utah
Wyoming State Office -------- Wyoming and Nebraska

(b) A list of the names, addresses, and geographical areas of jurisdiction of all Field Offices of the Bureau of Land Management can be obtained at the above addresses or any office of the Bureau of Land Management, including the Washington Office, Bureau of Land Management, 1849 C Street, NW, Washington, DC 20240.

Eldorado-Ivanpah Transmission Project

Right-of-Way Grant
550-kV Telecommunications Route

Anticipated Submittal Date: 10-31-11

Eldorado-Ivanpah Transmission Project

Programmatic Agreement

PROGRAMMATIC AGREEMENT
AMONG
THE BUREAU OF LAND MANAGEMENT,
THE SOUTHERN CALIFORNIA EDISON COMPANY,
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER,
AND THE NEVADA STATE HISTORIC PRESERVATION OFFICER
REGARDING THE MANAGEMENT OF
HISTORIC ELECTRIC POWER CONVEYANCE SYSTEMS
IN THE STATES OF CALIFORNIA AND NEVADA

WHEREAS, the Southern California Edison Company (hereinafter, "SCE") holds and applies for right-of-way (ROW) grants and permits on public lands managed by the Bureau of Land Management in California and Nevada (hereinafter, "the BLM") in accordance with the Federal Land Policy and Management Act (P.L. 940-579, as amended; hereinafter, "FLPMA") for the purpose of constructing, operating, maintaining, modifying, or replacing electrical power distribution and conveyance facilities, some of which are included in or may be eligible for inclusion in the National Register of Historic Places (hereinafter, "historic properties" and "the NRHP"); and

WHEREAS, the BLM considers requests to grant a ROW or issue permits to other applicants for actions which may require the modification, removal, or replacement of electric power conveyance systems and related facilities owned by SCE and other historic properties that may be affected by such Undertakings; and

WHEREAS, the BLM has determined that the modification, removal, or replacement of electric power conveyance systems and related facilities owned by the SCE located on BLM lands or subject to BLM approval is an "Undertaking" as defined in 36 CFR 800.16(y) requiring a ROW grant or Federal permit , which are Federal actions as described at 36 CFR 800.3(a), which may result in similar, redundant, and repeated types of adverse effects on electric power conveyance facilities that are historic properties owned by SCE; and

WHEREAS, this Programmatic Agreement (Agreement) provides a programmatic approach that effectively, efficiently, and consistently takes into account the effects of Undertakings on electric power conveyance facilities that are historic properties and the background and intent of the Agreement are further described in Appendix A; and

WHEREAS, the BLM has consulted with the California and Nevada State Historic Preservation Officers (SHPO), to participate in consultation to resolve the potential adverse effects of an Undertaking on historic properties and the BLM chooses to continue its assessment of an Undertaking's potential adverse effect and resolve any such effect through the implementation of this Agreement; and

WHEREAS, in accordance with regulations at 36 CFR 800.14(b)(3), the BLM has notified and invited the Advisory Council on Historic Preservation (hereinafter, "ACHP") per 36 CFR 800.6(a)(1)(C) to participate in consultation to resolve the potential effects of an Undertaking on Historic Properties, and as per their letter dated December 14, 2009, the ACHP has elected not to participate in this Agreement; and

WHEREAS, SCE has participated in consultation per 36 CFR 800.2(c)(4), is willing to carry out the stipulations of this Agreement under the oversight of the BLM, and is an Invited Signatory to this Agreement; and

WHEREAS, SCE maintains a document and photographic archive at the Huntington Museum, Pasadena, California, which provides documentation and curation of SCE records and demonstrates SCE's commitment to preservation of historic records about historic projects and infrastructure; and

WHEREAS, the stipulations of this Agreement shall be appended to and made a part of any BLM Environmental Impact Statement/Record of Decision authorizing any Undertaking including but not limited to other Programmatic or Memorandum of Agreements that intends to use this Agreement to resolve adverse effects to historic properties that are the subject of this Agreement; and

NOW, THEREFORE, the BLM and the California and Nevada State Historic Preservation Officers (hereinafter, "Signatories) and the SCE, as an Invited Signatory, agree that Undertakings shall be implemented in accordance with the following stipulations in order to take into account the effects on historic properties.

STIPULATIONS

BLM agrees to ensure the following stipulations are carried out:

I. DEFINITIONS

The definitions found at 36 CFR 800.16 apply throughout this Agreement except where another definition is offered as follows:

"Related undertaking" or **"related project"** is an Undertaking requiring the grant of a ROW or issuance of a permit by the BLM to an applicant other than SCE that may require the modification or replacement of components of electric power conveyance systems which may be historic properties owned or managed by SCE.

"Consulting parties" means collectively the Signatories and Invited Signatories to this Agreement, without implying any change regarding the authorities of any of those parties to amend or terminate this Agreement.

"Cultural resources" refers to an object or location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, buildings, places, or objects and definite locations of traditional cultural use by specified social and/or culture groups. Cultural resources include the entire spectrum of resources, from artifacts to cultural landscapes, without regard to eligibility for inclusion in the NRHP.

"Electric power conveyance facilities" refers to transmission power lines that typically carry at least 115 kV of electricity, sub-transmission lines that convey between 66 and 115 kV, distribution lines that carry less than 66 kV, and substations/switching stations that serve all three levels of power transmission. Electric power conveyance facilities include the wood poles and lattice steel towers, H-frame structures (of wood or steel construction) and any other types of poles or towers that support the electrical lines above the ground, and substations, buildings, other types of structures or objects that contribute to the physical transmission, or delivery of electrical power.

"Invited Signatories" include consulting parties (e.g., SCE) who have responsiblities within the consultation process described in this Agreement. Invited Signatories have the same rights with regard to seeking amendments or termination of this Agreement as the other Signatories.

"Right-of-Way" or **"Right-of-Way Corridor"** (ROW) is as defined in FLPMA (Section 501 [43 U.S.C. 1761], "Grant, Issue or Renewal of Rights-of-Ways" and 503 [43 U.S.C. 1763], "Right-of-Way Corridors", respectively), and means an area of land designated by a federal land management agency for use by by a grantee for the construction, operation and maintenance of a project.

"Signatories" refers to the BLM and the SHPOs. Signatories have responsiblities within the consultation process described in this Agreement. Signatories have the sole authority to execute, amend or terminate this Agreement.

II. SCOPE OF THIS AGREEMENT

a) Unless otherwise agreed to by the consulting parties through the process described in Stipulation XII, this Agreement will apply only to:

   i) elements of SCE electric power conveyance facilities located on lands managed by the BLM, unless the Federal action extends to non-Federal lands where an Undertaking lacks independent utility.

   ii) the identification and treatment of adverse effects to certain types of electric power conveyance facilities associated with SCE electric power systems included in, or eligible for inclusion in the NRHP, including lattice steel towers, H-frame structures (of wood or steel construction), wood poles, and associated substation/switching stations that are contributing elements to historic properties. This Agreement does

not include buildings, structures or objects not associated with electric power conveyance systems, or archaeological sites unless they are components of or the remains of components of an electric power conveyance facility; and

b) The treatment measures prescribed in this Agreement shall supersede any other prior Programmatic Agreement or Memorandum of Agreement that might otherwise be applicable to the treatment of adverse effects to the historic properties subject to this Agreement.

c) The terms of this Agreement may be used to resolve the specific adverse effects described in this Agreement for a Undertaking proposed by SCE, or in consultation with SCE, another Applicant whose Undertaking may have an adverse effect on an SCE electric power conveyance facility.

i) This Agreement may stand alone to resolve the effects for an Undertaking where adverse effects to a component of an SCE electric power conveyance facility are the only effects to be resolved.

ii) This Agreement may be referenced or included as an appendix to another Agreement to resolve the effects for an Undertaking where adverse effects to a component of an SCE electric power conveyance facility is not the only effect to be resolved.

III. AREA OF POTENTIAL EFFECTS

a) The Area of Potential Effect (APE) is defined as the total geographic area or areas within which the undertaking may directly or indirectly cause alterations in the character or use of historic properties per 36 CFR 800.16(d).

i) The APE is limited to those elements of SCE's electric power conveyance facilities which contain historic properties subject to this Agreement that could sustain direct and indirect physical effects as a result of the undertaking.

(1) Direct effects may result from the modification, removal, or replacement of electric power conveyance facilities.

(a) Where modification, removal or replacement of multiple electric power conveyance facilities may occur, the APE shall be defined in a manner to consider effects to a historic landscape embodied by the facilities.

(2) Indirect effects may result from alterations in the character or use of an electric power conveyance facility or a historic landscape of which an electric power conveyance facility is a component.

(a) Where introduction of visual, auditory, or atmospheric elements diminish the integrity of a property's significant historic features.
(b) Where removal of an electric power conveyance facility diminish the integrity of values that define a historic landscape.

ii) The APE may be amended by written agreement of the Signatories, in consultation with SCE.

IV. ROLES AND RESPONSIBILITIES

a) The BLM shall be responsible for ensuring compliance with Section 106 of the NHPA, providing oversight of this Agreement, coordinating the roles of other consulting parties, participating in the resolution of objections among the consulting parties, and providing technical assistance and guidance as needed to the other consulting parties to this Agreement.

i) The BLM California Desert District Office (CDDO) will assume primary management and responsibility for implementing the terms of this Agreement, and will coordinate with the BLM Field Offices on implementation of this Agreement on lands under their management responsibility.

ii) SCE projects or other projects that may utilize the provisions of this Agreement within a single State may be managed by the appropriate BLM Field Office.

iii) The BLM CDDO will coordinate with all offices utilizing this Agreement for Undertakings that occur in both California and Nevada.

iv) Any District or Field Office within the California Desert District or Southern Nevada District of BLM may be the lead Federal agency for an Undertaking which may utilize the terms of this Agreement.

b) The BLM shall be responsible for reviewing and approving all actions covered by this Agreement carried out by SCE or other Applicants to comply with Section 106 of the NHPA, including:

i) identification of cultural resources within the APE of each Undertaking;

ii) evaluations of NRHP eligibility of cultural resources and consultation with SHPOs regarding NRHP eligibility;

iii) determinations of effects on historic properties;

iv) implementation of treatment measures to resolve any adverse effects on historic properties per this Agreement; and

v) other historic preservation measures for which an Applicant may be made responsible under this Agreement.

c) Unless otherwise agreed to by the consulting parties, the following procedures and timing will apply to activities carried out per the terms of this Agreement.

i) Minor modifications as outlined in Appendix C to properties listed in Appendix B shall be managed by standard recordation treatment and documented in an annual report of activities authorized under this Agreement and submitted to the SHPOs by BLM.

ii) Upon the submission of any documents or at the request of the SCE, BLM will have 20 days to review and comment. SCE will have 10 days to respond to BLM comments. Upon review and acceptance of any document or report required by this Agreement, BLM will submit the document or report to the SHPO(s) who will have 30 days to comment.

iii) The BLM will have 20 days to review and comment on any SCE recommendations. If the BLM disagrees with any SCE recommendation, BLM may direct SCE to reconsider or the BLM and SCE may consult with the appropriate SHPO(s) to resolve the disagreement.

iv) The SHPO(s) will have 30 days from receipt of adequate documentation to respond to the BLM's determinations of eligibility.

V. STANDARDS AND QUALIFICATIONS

a) **PROFESSIONAL QUALIFICATIONS.** All actions prescribed by this Agreement shall be carried out by or under the direct supervision of a person or persons meeting, at a minimum, the *Secretary of the Interior's Professional Qualifications Standards* (PQS) for archaeology, history, or architectural history, as appropriate (48 FR. 44739). Those actions include the identification, evaluation, analysis, recordation, treatment, monitoring, and disposition of historic properties and that involve the reporting and documentation of such actions in reports, forms or other records. However, nothing in this stipulation may be interpreted to preclude any party qualified under the terms of this paragraph from using the services of properly supervised persons who do not meet the PQS.

b) **DOCUMENTATION STANDARDS.** Reporting and documenting the actions cited in Paragraph IV(a) of this stipulation shall conform to every reasonable extent with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR. 44716-44740). The BLM will ensure that recordation and documentation of appropriate cultural resources is consistent with California Department of Parks & Recreation (hereinafter, DPR) form 523, Nevada Cultural Resource

Information System (hereinafter, NVCRIS) form HRIF, National Park Service (hereinafter, "NPS") Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey (hereinafter, "HABS/HAER/HALS") Guidelines (e.g., Federal Register vol. 68, no. 139, pp. 43159-43162 http://edocket.access.gpo.gov/2003/03-8197.htm]; *and* http://www.nps.gov/history/hdp/standards/index.htm); and ACHP archaeological guidance at http://www.achp.gov/archguide/, the BLM 8100 Manual, and the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, as applicable.

VI. EVALUATION OF ELECTRIC POWER CONVEYANCE FACILITIES

a) The BLM will consult with both SHPOs, as appropriate, regarding the NRHP eligibility of any SCE electric power conveyance facility that extends across the line demarcating the states of California and Nevada and that includes structures that may be adversely affected by an Undertaking subject to this Agreement.

   i) For any historic property located entirely within one State, the BLM will consult with the SHPO for that State.

   ii) Pursuant to the process provided at Stipulation IV(c), the SHPOs may comment on the NRHP eligibility of unevaluated properties or properties previously evaluated.

   iii) The BLM will coordinate with the SHPOs to manage historic properties in a consistent manner in both states. Prior determinations of eligibility in either State made in consultation with the appropriate SHPO shall remain in force unless the BLM and the appropriate SHPO consult and agree to amend the prior determinations.

b) SCE will assess whether the electric power conveyance facilities within the APE and subject to this Agreement retain historical integrity, taking into account that such facilities have historically undergone modification as part of periodic and routine maintenance. Past periodic and routine maintenance shall be considered a historic activity. Such modifications shall not be considered to have affected the historic integrity of the properties if:

   i) electric power conveyance structures are original construction or substantially retain their original fabric, look, and feel; and

   ii) all post-period-of-significance modifications were in-kind and retain original design integrity, for example original porcelain insulators have been replaced with porcelain insulators (i.e., the presence of porcelain insulators is sufficient for integrity to be maintained); and modifications such as retro-installed concrete tower footings have been installed to ensure original tower stability and meet safety requirements.

c) The BLM, in consultation with SCE, may treat a SCE electric power conveyance facility as eligible for the NRHP for project management purposes and proceed to assess the effects of an Undertaking on those historic properties consistent with Stipulation VIII of this Agreement.

VII. TREATMENT OF HISTORIC PROPERTIES / STANDARD TREATMENT MEASURES

a) SCE will develop historic contexts for portions of its electric power conveyance systems subject to this Agreement as provided for in Stipulation VII(b). Such contexts shall establish the historical significance of any property with the APE and identify its period of significance. SCE may develop a comprehensive historic context for its generation and distribution systems that may be applied to any historic properties subject to this Agreement provided that the historic context presents a level of detail so that all types of structures within the APE are described and their historical significance evaluated.

b) SCE will develop a typology of structures for properties within the APE sufficient to distinguish among structure types and assist in structure evaluation by taking into account design, engineering, function, materials and methods of construction and any other variables that differentiate the function of structures in a distribution system.

i) Within six months of the date of execution of this Agreement, SCE will submit the following to the Signatories.

(1) The following shall be included in Appendix B to this Agreement.

(a) An initial list of historic transmission lines, segments, or known historic properties that SCE recommends be subject to the terms of this Agreement and a justification for their inclusion.
(i) SCE may modify or add to the list of historic facilities subject to the terms of this Agreement at any time by notifying the Signatories, providing a description of the facility and justification for its inclusion.
(b) An initial list of structure typologies and historic contexts.
(c) An initial list of historic properties that will be affected by current projects and a summary of actions taken or to be taken to resolve adverse effects per the terms of this Agreement.

(2) The following shall be included in Appendix C to this Agreement.

(a) An initial list of minor actions affecting NRHP eligible SCE electric conveyance system features that will be subject, without further consultation, to standard treatment measures, and reported to the consulting parties annually.

c) SCE may submit structure typologies, historic contexts, and resource evaluations for any specific Undertaking separately or concurrently.

VIII. MANAGEMENT OF EFFECTS ON HISTORIC PROPERTIES

a) The BLM will apply the criteria of adverse effect found at 36 CFR 800.5(a)(1) to historic properties within the APE to assess whether any electric power conveyance facility that is a contributing element of any proposed historic property may sustain adverse effects of any Undertaking subject to this Agreement.

   i) If the BLM finds an adverse effect, the BLM will proceed to resolve the adverse effect consistent with the terms of this Agreement.

   ii) Removal of wood distribution system poles from any historic property will be considered not adverse if poles are replaced with wood poles of similar size on a one-for-one basis with no alignment change.

b) In the event that an Undertaking subject to this Agreement causes adverse effects on a historic property, the resolution of adverse effects on the historic property shall be as follows.

   i) For each type of structure identified in the typology per Stipulation VII(b) and approved by BLM and the SHPOs per Stipulation IV(c), SCE will, in California, prepare a DPR Form 523 and Building/Structure/Object supplement for review by the BLM. Upon BLM approval, the form will be submitted to the appropriate California Historical Resources Information System (CHRIS) Information Center as directed by BLM. For each type of structure in Nevada, SCE will prepare a Historic Resources Inventory Form (HRIF), provide the form for review to the BLM, and upon approval by the BLM submit the form to the Nevada SHPO.

   ii) Consistent with Stipulation VI(b), SCE will recommend the level of HABS/HAER/HALS documentation that is appropriate to record any historic structure types or landscapes that may sustain adverse effects and submit to BLM a proposal to implement the recordation.

      (1) Unless otherwise agreed to or required by the Signatories, the HABS/HAER/HALS documentation for an Undertaking may be classed as "informal," meaning that although prepared to National Archive standards, the final documents are submitted only to the California State Library, SHPO, the California Historical Resources Information System, the Huntington Museum, the Nevada State Museum in Las Vegas, or other facilities as agreed upon by the consulting parties.

(2) Upon completion of the HABS/HAER/HALS recording and assembling of records, drawings, etc. for archiving, SCE will submit the HABS/HAER/HALS recording and an executed agreement between SCE and a library, archives or other repository stipulating that SCE will donate the appropriate items.

(3) For effects to an individual structure type, one example of each type of structure that contributes to the NRHP eligibility shall be documented according to HABS/HAER standards. One example shall be sufficient treatment for all such structures associated with a given Undertaking subject to this Agreement.

(4) HABS/HAER recordation will be required only once for each state for any given type of structure as defined in the historic context for the affected historic property, regardless where it is on a given SCE project or if it also occurs on other SCE projects. If SCE proposes to remove or modify a type of structure already documented, SCE will notify the BLM in writing, provide a written and photographic description of the structure(s) to be affected, and reference the previous HABS/HAER recordation. SCE will also present a graphic representation of the affected distribution line indicating what if any other structures have been previously treated, indicating the position on the line of the structures to be modified or removed. If the structures have been recorded on separate SCE projects, SCE will provide a graphic of the project showing the number and location of structures previously treated. In case records and files for individual SCE projects are archived separately, SCE will also indicate to the BLM if there are any additional records, drawings or other materials that pertain to the affected structures that should be added to the archives and submit proof that such materials have been archived.

(5) Where modification, removal or replacement of multiple electric power conveyance facilities may occur and such facilities constitute a historic landscape, HALS documentation of the historic landscape shall be the appropriate treatment.

c) For each Undertaking resulting in a modification of a historic property subject to this Agreement and affecting a structure type already addressed per Stipulation VIII(b), SCE will provide to the BLM, a brief report documenting original compliance with Stipulation VIII(b). Minor modifications as outlined in Appendix C to properties listed in Appendix B shall be subject to standard treatment and reported annually to the consulting parties.

IX. RESOLVING OBJECTIONS

a) Should a Signatory or Invited Signatory object at any time, to the manner in which the terms of this Agreement are implemented, the BLM will immediately notify the consulting parties and request their comments on the objection within 30 days, and then proceed to consult with the Signatory or Invited Signatory for no more than 30 days to resolve the objection.

b) If the objection can be resolved within the consultation period, the BLM may authorize the disputed action to proceed in accordance with the terms of such resolution.

c) If at the end of the 30 day consultation period, the BLM determines that the objection cannot be resolved through such consultation, the BLM will forward all documentation relevant to the objection to the ACHP per 36 CFR 800.2(b)(2). Any comments provided by the ACHP within 30 days after its receipt of all relevant documentation will be taken into account by the BLM in reaching a final decision regarding the objection. The BLM will notify the consulting parties and the ACHP in writing of its final decision within 14 days after it is rendered. The BLM shall have the authority to make the final decision resolving the objection. The BLM's responsibility to carry out all other actions under this Agreement that are not the subject of the objection will remain unchanged.

d) At any time during implementation of the terms of this Agreement, should an objection pertaining to the Agreement be raised by a member of the public, the BLM shall immediately notify the SHPOs about the objection and take the objection into account. The other Signatories and Invited Signatories may comment on the objection to the BLM. The BLM shall consult with the objecting party(ies) for no more than 30 days. Within 14 days following closure of consultation, the BLM will render a decision regarding the objection and notify all parties of its decision in writing. In reaching its final decision, the BLM will take into account all comments from the parties regarding the objection. The BLM shall have the authority to make the final decision resolving the objection.

e) Any dispute pertaining to the NRHP eligibility of historic properties or cultural resources covered by this Agreement will be addressed by the BLM per 36 CFR 800.4(c)(2). A determination of eligibility by the Keeper of the National Register will be the final determination in the matter and will be accepted by all consulting parties to this Agreement.

X. REPORTING AND ACCOUNTABILITY

a) The BLM CDDO will coordinate all reporting required by this Agreement.

b) By December 1 of each year following the execution of this Agreement until it expires or is terminated, the BLM CDDO shall provide the consulting parties to this Agreement a summary report detailing work undertaken pursuant to its terms. Such report shall include a summary of actions taken pursuant to this Agreement, any scheduling changes proposed, any problems encountered, and any disputes and objections received in the BLM's efforts to carry out the terms of this Agreement.

   i) On or after October 1 of each year, the SCE shall provide the BLM CDDO a summary of actions taken pursuant to this Agreement, including an account of the SCE projects that utilized the provisions of this Agreement, an account of the adverse

effects to historic properties resolved under the terms of this Agreement, and a summary of the actions taken to resolve effects pursuant to this Agreement.

c) Reporting pursuant to this Agreement may be incorporated in the annual reporting requirements for the BLM California Protocol Agreement. BLM Nevada may separately submit the annual report for this Agreement to the Nevada SHPO as part of its reporting requirements for the BLM Nevada Protocol Agreement.

XI. DURATION OF THIS AGREEMENT

a) This Agreement will expire if the stipulations of this Agreement have not been initiated within five (5) years from the date of its execution. Prior to the expiration date of this Agreement, the BLM may consult with the other consulting parties to extend the Agreement or reconsider the terms of the Agreement and amend it in accordance with Stipulation XII. The BLM shall notify the Signatories as to the course of action the agency will pursue within 30 days of the expiration of the Agreement.

b) This Agreement expires 25 years from its effective date unless extended by written agreement of the Signatories. The Signatories and Invited Signatories shall consult at year 10 to review this Agreement. Additionally, the Signatories and Invited Signatories shall consult not less than one year prior to the expiration date to reconsider the terms of this Agreement and, if acceptable, have the Signatories extend the term of this Agreement. Reconsideration may include continuation of the Agreement as originally executed or amended, or termination. Extensions are treated as amendments to the Agreement under Stipulation XII.

c) Unless the Agreement is terminated pursuant to Stipulation XIII or another agreement executed for the a specific undertaking supersedes it, this Agreement will remain in full force and effect until BLM, in consultation with the other Signatories and Invited Signatories, determines that implementation of all aspects of the undertaking has been completed and that all terms of this Agreement and any subsequent tiering requirements have been fulfilled in a satisfactory manner. At such time, BLM will notify the consulting parties of this Agreement in writing of the agency's determination. This Agreement will terminate and have no further force or effect on the day that BLM so notifies the Signatories to this Agreement.

XII. AMENDMENT

a) Any Signatory or Invited Signatory to this Agreement may at any time propose amendments, whereupon all Signatories shall consult to consider such amendments pursuant to 36 CFR 800.6(c)(7) and 800.6(c)(8). This Agreement may be amended only upon written agreement of the signatories.

b) Amendments to this Agreement shall take effect on the date of full execution by the Signatories.

c) Modifications, additions, or deletions to the appendices made as a result of continuing consultation among the consulting parties shall not require the Agreement to be amended.

XIII. TERMINATION

a) Only Signatories and Invited Signatories may terminate this Agreement. If this Agreement is not amended as provided for in Stipulation XII, or if a Signatory or Invited Signatory proposes termination of this Agreement for other reasons, the party proposing termination shall notify the other consulting parties in writing, explain the reasons for proposing termination, and consult for no more than 30 days to seek alternatives to termination.

b) Should such consultation result in an agreement on an alternative to termination, the Signatories and Invited Signatories shall proceed in accordance with that agreement.

c) Should such consultation fail, the Signatory or Invited Signatory proposing termination may terminate this Agreement by promptly notifying the other parties in writing.

d) Should this Agreement be terminated, the BLM shall either consult in accordance with 36 CFR 800.14(b) to develop a new Agreement or request the comments of the ACHP pursuant to 36 CFR 800.4–800.6.

e) Beginning with the date of termination, the BLM shall ensure that until and unless a new Agreement is executed for the undertakings covered by this Agreement, such undertakings shall be reviewed individually in accordance with 36 CFR 800.4-800.6.

f) This Agreement will terminate and have no further force or effect when BLM, in consultation with the other Signatories and Invited Signatories, determines that all terms of this Agreement have been fulfilled in a satisfactory manner on the day that BLM so notifies the other Signatories and Invited Signatories to the Agreement.

Execution and implementation of this Agreement is evidence that BLM has afforded the ACHP a reasonable opportunity to comment on the undertaking and its effects on historic properties. The Signatories to this Agreement represent that they have the authority to sign for and bind the entities on behalf of whom they sign.

[The remainder of this page is left bank]

SIGNATORY PARTIES

U.S. BUREAU OF LAND MANAGEMENT (California)

BY: _____ DATE: 9/27/10

James Wesley Abbott
State Director

U.S. BUREAU OF LAND MANAGEMENT (Nevada)

BY: Ron Wenker DATE: 9/27/10

Ron Wenker
State Director

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

BY: milford wayne donaldson DATE: 27 SEP 2010

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

NEVADA STATE HISTORIC PRESERVATION OFFICER

BY: Rebecca Palmer DATE: 9/27/10

for Ronald James
State Historic Preservation Officer

INVITED SIGNATORY

SOUTHERN CALIFORNIA EDISON COMPANY

BY: P Multari DATE: 10-7-10

Paul Multari
Director, Project Management Organization

APPENDIX A: BACKGROUND AND INTENT

SCE provides reliable electric service to more than 13 million people in 180 cities in 50,000 square miles of service area in central, coastal and southern California. Electric power conveyance facilities are constantly subject to maintenance, modification, reconfiguration and replacement in order to continue to serve as viable system components.

Several of SCE's electric power conveyance facilities are situated on and cross Bureau of Land Management (BLM) land in California and Nevada. The BLM must grant ROWs or permits to build and operate facilities on BLM land in accordance with the Federal Land Policy and Management Act (P.L. 940-579). The BLM must also comply with Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) (NHPA) prior to issuing ROWs or permits to build or modify these electric power facilities.

Many of the facilities throughout SCE's electric power systems were constructed in the early- to mid-20th century, and some of these are listed or eligible for the National Register of Historic Places (NRHP), while many other such resources have not been evaluated. Electric power conveyance facilities that are contributing elements to historic properties may be modified repeatedly as the result of adding new generation capacity into the electrical grid or for other reasons to meet federal and state efficiency and reliability standards.

The maintenance, modification or replacement of NRHP listed and eligible electric power conveyance facilities may adversely affect historic properties. Numerous proposed and future energy projects, system reconfigurations, and maintenance activities involve BLM lands with effects to historic properties that are similar and repetitive in nature. Accordingly, the BLM and State Historic Preservation Officers for California and Nevada (SHPOs) have determined that implementation of this Programmatic Agreement (hereinafter, "Agreement") prepared pursuant to 36 CFR 800.14(b)(1)(i) and (iii), will fulfill the requirements of NHPA Section 106 for multiple undertakings by effectively, efficiently, and consistently considering the effects of those undertakings on electric power conveyance facilities that are historic properties.

Highlights of this Agreement

The treatment of adverse effects under this Agreement is limited to electric power conveyance facilities (transmission, sub-transmission, and distribution line structures, and substation/switching stations) associated with SCE electric power systems listed in, or eligible for listing in the NRHP, including lattice steel towers, H-frame structures (of wood or steel construction), wood poles, switch racks, circuit breakers, transformers, and other ancillary features that are contributing elements to historic properties. This Agreement does not include buildings, other types of structures, objects or archaeological sites that are historic properties unless they are directly associated with the Historic Property/Historic District electric power conveyance system. If historic properties not related to the electric power conveyance system are present and would be adversely affected by an Undertaking, a separate agreement or treatment plan would be necessary.

This Agreement describes a programmatic approach that:

(1) stipulates roles and responsibilities of participating agencies and others;

(2) facilitates identification of historic properties;

(3) determines adverse effects,

(4) establishes treatment and mitigation measures; and

(5) streamlines the resolution of adverse effects.

SCE has specific responsibilities for managing historic properties according to this Agreement, including:

(1) certain routine historic properties management activities (per 36 CFR 800.14(b)(1)(iv));

(2) development of a typology for electrical towers that will facilitate their evaluation and allow SCE to determine the types and number of towers of various types that may be affected by undertakings;

(3) development of historic contexts for electrical power systems that provides the background for evaluation;

(4) implementing standard treatment measures stipulated in this Agreement including various levels of resource recordation such as California DPR forms and HABS/HAER recording of only one of each type of structure, or HALS recording where a group of structures may constitute a historic landscape, to take into account routine and repetitive adverse effects of undertakings on historic properties (per 36 CFR 800.14(b)(1)(v)); and

(5) producing an annual report of activities undertaken under the terms of this Agreement including certain routine activities listed in Appendix C for which SHPO notification is the only regulatory requirement.

The stipulations of this Agreement may be appended to and made a part of the BLM's Record of Decision authorizing any SCE project or non-SCE project that would utilize the terms of this Agreement, after consultation with SCE.

APPENDIX B: HISTORIC PROPERTY TYPES SUBJECT TO THIS AGREEMENT AND RELEVANT TYPOLOGIES

APPENDIX C: MINOR ACTIONS NOT SUBJECT TO FURTHER CONSULTATION AND STANDARD TREATMENT

[Minor Actions Example]

1. Retrofit concrete footings on steel lines not originally constructed with concrete footings.
2. Small-scale or individual structure replacement/repair of original equipments such as insulators, guy-wires, tower steel, conductors, jumpers, etc. that does not substantially change the look and feel of the structure.
3. Replacement of overhead groundwire with fiber-optic imbedded groundwire, installation of cell or other communications antennae (non-permanent and reversible).

[Standard Treatment Example]

1. Recordation on CA DPR Form 523 or NV Form HRIF.
2. Before and after photo image documentation reported annually to BLM.

Eldorado-Ivanpah Transmission Project

National Wide Permit (404)
Permit SPK-2010-00576-SG

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

June 8, 2011

Regulatory Division (SPK-2010-00576-SG)

Hazem Gabr
Southern California Edison
1218 South 5th Avenue Office 230V
Monrovia, CA 91016

Dear Mr. Gabr:

We are responding to your May 23, 2011 request for a Department of the Army permit for the El Dorado Ivanpah Transmission Line project. This approximately 13.98-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to upgrade approximately 35 miles of existing single circuit 115-kv sub-transmission line to double circuit 230-kv transmission line between the Ivanpah Dry Lake area and the existing El Dorado Substation. The project also includes a new substation and upgrades to the El Dorado Substation. The project is located on or near Ivanpah Lake, Section 8, Township 27 S, Range 59 E, Mount Diablo Meridian, Latitude 35.7125°, Longitude -115.20546°, Primm, Clark County, California.

Based on the information you provided, the proposed activity, resulting in the permanent loss of approximately 0.014 acres of ephemeral wash and 0.014 acres of a dry lake bed and temporary impacts to approximately 13.449 acres of Ivanpah Dry Lake and 0.512 of ephemeral washes, is authorized by Nationwide Permit Number NWP 12 Utility Line Activities. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and the following special conditions:

Special Conditions

1. This permit is contingent upon issuance of a Section 401 Water Quality Certification. All terms and conditions of the Water Quality Certification are expressly incorporated as conditions of this permit.
2. The Permittee is responsible for all work authorized herein and ensuring that all contractors and workers are made aware and adhere to the terms and conditions of this permit authorization. You shall ensure that a copy of the permit authorization and associated drawings are available for quick reference at the project site until all construction activities are completed.

3. You and your authorized contractor shall allow representatives from this office to inspect the authorized activity and all mitigation, and avoidance areas at any time

deemed necessary to ensure that work is being or has been accomplished in accordance with the terms and conditions of this **permit/verification**.

4. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register.

5. This Corps permit does not authorize you to take an endangered species, in particular Desert Tortoise (*Gopherus agassizii*) or designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The U.S. Fish and Wildlife Service Biological Opinion (Number 84320-2010-F-0448 dated April 29, 2011) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached Biological Opinion(s), which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion(s), where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The U. S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its/their Biological Opinion(s), and with the Endangered Species Act. You must comply with all conditions of this/these Biological Opinion(s), including those ascribed to the Corps.

6. The Mitigation and Monitoring Plans for affected jurisdictional areas and dry lake bed restoration plans must be submitted to this office prior to construction. The mitigation area shall be monitored for at least five (5) consecutive growing seasons after construction, and/or until the Corps determines the success criteria are met.

7. You shall notify this office of the start and completion dates for each phase of the authorized work within 10 calendar days prior to initiation of construction activities within waters of the U.S. and 30 calendar days following completion of construction activities.

8. Within 10 days prior to initiation of construction activities within waters of the United States, you shall submit to the Corps pre-construction site photographs of the project site, which have been taken no more than 30 days prior to initiation of construction activities. Within 30 days following construction activities, you shall submit post-construction site photographs of the project site, showing the work conducted, to this office. The camera positions and view angles of post-construction photographs shall be identified on a map, aerial photo, or project drawing. Construction locations shall

include all major project features and waters of the United States, including mitigation areas.

You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid until March 18, 2012, when the existing Nationwide Permits are scheduled to be modified, reissued, or revoked. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit. Failure to comply with the General Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website at http://per2.nwp.usace.army.mil/survey.html and select Sacramento District – St. George Office on page 2 of the survey form.

Please refer to identification number SPK-2010-00576-SG in any correspondence concerning this project. If you have any questions, please contact Patricia Mcqueary at 321 North Mall Drive, Suite L-101, St. George, Utah 84790, email *Patricia.L.McQueary@usace.army.mil*, or telephone 435-986-3979. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Patricia L. McQueary
Senior Regulatory Project Manager
St. George Regulatory Office
Sacramento District

Enclosure(s)
Compliance Certification
List of Waters
Maps of project area
NWP 12 Fact Sheet
Copy furnished without enclosure(s)
Jeryl Gardner, 901 S. Stewart Street Suite 4001, Carson City, Nevada 89701-5249
Jean Stone, 901 S. Stewart Street Suite 4001, Carson City, Nevada 89701-5249
Nevada Fish and Wildlife Office, U.S. Fish and Wildlife Service, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130
Rebecca Palmer, NHPO, 100 N. Steward Street, Carson City, Nevada 89701

COMPLIANCE CERTIFICATION

Permit File Number: SPK-2010-00576-SG

Nationwide Permit Number: NWP 12 Utility Line Activities.

Permittee: Curtis Wambach
Southern California Edison
2244 Walnut Grove Avenue
Rosemead, California 91770

County: Clark

Date of Verification: June 8, 2011

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Sacramento District
321 N Mall Drive Suite L-101
St. George, Utah 84790
Patricia.l.mcqueary@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the Corps of Engineers.

* * * * * * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

_____ _____
Signature of Permittee Date

Eldorado-Ivanpah Transmission Project

Section 7 Biological Opinion (BA/BO)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2010-F-0096
8-8-10-F-24

June 10, 2011

Memorandum

To: District Manager, California Desert District, Bureau of Land Management, Moreno Valley, California

From: Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California

Subject: Biological Opinion on BrightSource Energy's Ivanpah Solar Electric Generating System Project, San Bernardino County, California [CACA-48668, 49502, 49503, 49504] (8-8-10-F-24R)

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the Bureau of Land Management's (Bureau) issuance of a right-of-way grant to Solar Partners I, LLC, Solar Partners II, LLC, and Solar Partners VIII, LLC for the Ivanpah Solar Electric Generating System (ISEGS) and its effects on the federally threatened desert tortoise (*Gopherus agassizii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Because BrightSource Energy is a parent company for all Solar Partner Companies, this biological opinion refers to the project proponents collectively as BrightSource. The proposed project involves construction, operation, maintenance, and decommissioning of a 370-megawatt solar thermal power plant and associated infrastructure and facilities on 3,582 acres of public land managed by the Bureau. This biological opinion replaces our October 1, 2010 biological opinion previously issued for the Bureau's right-of-way grant for the ISEGS project (Service 2010d). Your February 24, 2011 request for re-initiation of the October 1, 2010, consultation was received in our office on February 28, 2011, and was followed by information to support your request on March 25, 2011 and April 25, 2011.

We based this biological opinion on information you provided on March 25 and April 25, 2011, information that accompanied your initial December 7, 2009, request for consultation, and additional information regarding population estimates and revisions to the translocation strategy. This information includes the biological assessment to support re-initiation (Bureau 2011a), Unit 1 clearance survey data (Woodman 2011a), population survey data for Units 2, 3, and the revised recipient sites (Vaughn 2011, Woodman 2011b), the biological assessment for the previous consultation and its revision (CH2MHill 2009a, 2010a), the draft environmental

impact statement and final staff assessment (Bureau and California Energy Commission 2009), the supplemental draft environmental impact statement (Bureau 2010), the management plan for common ravens (CH2MHill 2008b), the project site reclamation plan (CH2MHill 2009c), and the site plan for management of weeds (CH2MHill 2008c). A record of this consultation can be made available at the Ventura Fish and Wildlife Office.

Construction, operation, maintenance, and decommissioning of the ISEGS facility and translocation of desert tortoises do not require activities that would adversely affect the primary constituent elements of critical habitat for the desert tortoise because the actions would not take place within critical habitat or directly or indirectly affect the primary constituent elements. Therefore, we do not address critical habitat in this biological opinion.

Consultation History

On December 7, 2009, the Bureau initiated consultation for construction, operation, maintenance, and decommissioning of the ISEGS facility. Following public comment on the Bureau's draft environmental impact statement and the California Energy Commission's final staff assessment, BrightSource modified its project to reduce adverse effects to desert tortoises and rare plant species. On April 26, 2010, we issued a draft biological opinion to the Bureau (Service 2010c). We revised the draft biological opinion based on comments from the Bureau and BrightSource. On July 21, 2010, the Bureau provided us with a revised translocation strategy (Fesnock 2010b) that required significant revisions to the draft biological opinion. On September 21, 2010, the Bureau provided additional changes to the translocation strategy (Fesnock 2010a), requiring further revisions of the draft biological opinion. On October 1, 2010, we issued a final biological opinion that analyzed the effects associated with the reduced project footprint, the revised translocation strategy, and the comments received from the Bureau and BrightSource.

Following desert tortoise clearance surveys of the first portion of the project, the Bureau provided an annual status report that summarized the results of these surveys (Bureau 2011b). This report did not provide any new information to suggest that the analysis in the 2010 biological opinion was inaccurate and, at that point, the Bureau had not exceeded the take exempted through the 2010 biological opinion. However, disease testing of desert tortoises cleared from Unit 1 of the project site indicated that the translocation strategy in the 2010 biological opinion required revision prior to moving forward with clearance surveys of the other portions of the project because this indicated that the adjacent translocation recipient sites were also likely to contain diseased animals. In addition, construction monitoring of perimeter fence installation around Units 2 and 3 in the winter and spring of 2011 indicated that these portions of the project might contain more desert tortoises than anticipated in the 2010 biological opinion. Based on the need to reassess the population estimates on Units 2 and 3 and the need to revise the translocation strategy to address disease concerns, the Bureau requested re-initiation of consultation on February 24, 2011 (Bureau 2011c). On March 15, 2011, we informed the Bureau that it had not provided sufficient information to initiate consultation

because its request did not include a biological assessment or other information to allow us to perform a new analysis (Service 2011a). On March 25, 2011, the Bureau provided additional information to support re-initiation of consultation (Fesnock 2011a). Following the start of consultation, the Bureau provided a revised biological assessment on April 25, 2011 (Bureau 2011a).

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Introduction

The Bureau has issued a right-of-way grant to BrightSource for the proposed project for a period of 30 years. BrightSource is proposing to construct and operate a solar energy plant approximately 4.5 miles southwest of Primm, Nevada, and 1.6 miles west of Ivanpah Dry Lake. The proposed site is 0.5 mile west of the Primm Valley Golf Club. The facility would consist of 3 solar electric generating plants, constructed over a 4-year period as follows: (1) Ivanpah 1 – construction of the Ivanpah 1 plant (southernmost site; 914 acres), construction of shared facilities (i.e., power substation, administrative facilities, water line, power lines, and construction logistics area), and improvement of Colosseum Road ; (2) Ivanpah 2 – construction of the Ivanpah 2 plant (middle site; 1,097 acres); and (3) Ivanpah 3 – construction of the Ivanpah 3 plant (northern site; 1,227 acres). BrightSource would also install a 5.7-mile natural gas distribution line, install a 9.5-mile fiber optic line, and re-route several dirt roads/trails that currently cross the proposed ISEGS site.

With respect to construction, operation, maintenance, and decommissioning of the ISEGS facility, the Bureau has not changed the description of the project from the previous consultation. We have restated those aspects of the 2010 biological opinion in addition to all of the previous general minimization measures, common raven measures, weed management measures, and the discussion of the Bureau's compensation requirements. Of these actions, BrightSource has fenced all portions of Unit 1, the construction logistics area (CLA), Colosseum Road, and portions of Units 2 and 3 with desert tortoise exclusion fencing. In addition, it fenced the access route and central power block of Unit 2. BrightSource has begun construction of the power block of Units 1 and 2 and has begun construction of the heliostat field for Unit 1.

This revision to the project description in this biological opinion focuses on the proposed changes to the translocation strategy, proposed modifications to desert tortoise handling procedures, and installation of desert tortoise fencing and culverts along Colosseum Road and Yates Well Road. We summarized the following description of the proposed action from the Bureau's biological assessment and the 2010 biological opinion (Bureau 2011a and Service 2010d).

Construction

Construction of the ISEGS facility would require an average workforce of 474 and a peak workforce of 959. Below, we have provided a detailed description of each stage of project development for the three project sites, the construction logistics area, and other associated infrastructure (i.e., access roads, water wells, water line, gas line and tie-in facility, fiber optic line, etc.). We have described the measures that BrightSource will implement to avoid or minimize adverse effects to the desert tortoise in a later section.

Construction Logistics Area

BrightSource would develop a construction logistics area (CLA) between the Ivanpah 1 and 2 project sites to accommodate construction support facilities (e.g., temporary construction trailers, construction tool sheds, construction lay down areas, and construction parking), the electrical tie-in substation, water wells, permanent facility parking areas, permanent administrative and warehouse facilities, and wheel wash areas. In addition, the CLA would accommodate a segment of Colosseum Road that BrightSource would re-route through the CLA to avoid the Ivanpah 2 project site.

CLA development would begin with surveying and staking the CLA boundaries and grading of a 10-foot-wide perimeter road along the boundary of the CLA to facilitate fence installation. BrightSource would then install an 8-foot high chain-link security fence with desert tortoise exclusion fencing attached to the bottom around the perimeter of the CLA. Alternatively, BrightSource may install desert tortoise exclusion and security fencing separately. Regardless of the method for fence installation, all site development and construction activities described for the CLA would occur within this fenced boundary. This includes grading of selected locations and construction or installation of all construction support facilities and permanent operational facilities.

Ivanpah 1, Ivanpah 2, and Ivanpah 3 Project Sites

Each project site would consist of one heliostat (mirror) array constructed around a 459-foot-tall centralized solar power tower. Ivanpah 1 would contain approximately 53,500 heliostats and Ivanpah 2 and 3 would contain approximately 60,000 heliostats each. Each heliostat consists of two 75.8-square-foot mirrors. All three units (Ivanpah 1, 2, and 3) would have their own individual power block; the biological assessment describes the components of the power blocks. In the re-initiation of consultation, the Bureau has expanded the work area for the power block of Unit 2 by 46 acres.

Prior to site development and construction activities for each phase, BrightSource would install a desert tortoise exclusion fence or a combined exclusion fence and security fence around the entire perimeter of the phase. BrightSource would use the same methods described above for the CLA in installation of this fence. Following fence installation, BrightSource would mow all

vegetation on the project sites to within 12 to 18 inches of the ground surface, grade a site for the power block, and grade additional areas within the project site for parking areas, construction lay down areas, building pads, and internal roads. During the construction stage, BrightSource would improve internal project-site roads, construct the power block, install the heliostat field, install underground piping and wiring, install the generation tie-line, and erect fabrication shops and other construction and administrative buildings. In addition, BrightSource would re-route existing dirt roads/trails around the perimeter of the project site.

Gas Line

In addition to the CLA and the three project sites, BrightSource would construct a 5.7-mile natural gas distribution pipeline. The pipeline would connect to the Kern River Gas Transmission line that traverses Ivanpah Valley 0.5 mile north of the Ivanpah 3 project site. At the point of connection with the Kern River Gas Transmission line, BrightSource would construct a permanent gas metering station (100 feet by 150 feet), requiring a 200-foot by 200-foot temporary construction area. From this metering station, the natural gas line and an 8- to 12-foot-wide access road would head south along the eastern edge of Ivanpah 3 to a metering station (10 feet by 40 feet) near the middle of its western side. From the metering station at Ivanpah 3, the gas line and access road would continue along the eastern edge of Ivanpah 2 to another metering station (20 feet by 40 feet) on the east side of Ivanpah 2. From the Ivanpah 2 metering station, the gas line would continue along the west side of Ivanpah 2 following the asphalt access road to Ivanpah 1. Gas line installation would require a 50-foot-wide construction corridor for access, storage of excavated soil, and pipefitting. In addition, construction of the Ivanpah 3 metering station would require a temporary lay down area within the Ivanpah 3 project site. The Ivanpah 1 and 2 metering stations would use a portion of the Ivanpah 2 solar field for construction lay down.

To allow for gas company access, BrightSource would construct the gas line, access road, and metering stations outside of the fenced project sites for Ivanpah 1, 2, and 3. A portion of the gas line to the Ivanpah 1 project site would be located within the fenced CLA. BrightSource would construct additional spur lines within the fenced project sites to carry gas from the edge of the respective project site to the main power block.

Construction activities related to the metering stations would include grading a pad and installing aboveground and underground gas piping, metering equipment, gas conditioning, pressure regulation, and pigging facilities. The construction contractor would determine which method to use to install the natural gas pipeline. The most common method of pipeline construction includes installation of the pipeline into an open trench approximately 36 inches wide and 3 to 10 feet deep.

Fiber Optic Line

To allow for remote monitoring of the new electrical substation, Southern California Edison (SCE) would construct an 8-mile fiber optic line from the Ivanpah substation to an interface point designated by the local telecommunication carrier in Mountain Pass. SCE would use existing distribution line poles for installation. Installation would require use of a bucket truck, four people, and two pick-up trucks. SCE would string out fiber optic cable between the existing poles. Every 10,000 to 20,000 feet, SCE would establish a 40-foot by 60-foot line stringing set. Crews would work within this area to raise the cable and string it tight over the existing poles. SCE estimates that approximately 20 poles are not accessible from the existing dirt service roads. Workers on foot would install the fiber optic line on these poles.

Access Road Fencing and Culvert Installation

Under the previous consultation, BrightSource fenced Colosseum Road to reduce desert tortoise injury and mortality associated with access route use. To further reduce the potential for mortality on other portions of the project access route, BrightSource would now fence Yates Well Road from Interstate 15 to Colosseum Road with desert tortoise exclusion fencing. The fencing of Yates Well Road would tie into the existing Colosseum Road fencing and into the Interstate 15 fencing. To reduce habitat and population fragmentation associated with this barrier, BrightSource would install three culverts under Colosseum Road to allow movement of desert tortoises under the road.

Operation

The ISEGS facility would have an operating life of up to 30 years and would operate 7 days a week for up to 14 hours a day. During operation, approximately 90 full-time employees would work at the site. ISEGS would use a maximum of 100 acre-feet of water per year for operational purposes. Heliostat washing is the only identified activity that we have described in this section because it is the only operational activity with the potential to have some effects on desert tortoise.

To keep heliostats clean, BrightSource would wash some portion of the heliostat field on a nightly basis, so that every heliostat within the 3 project sites is washed once every 2 weeks. The application rate per heliostat would be about 2.5 gallons per washing for a total use of 10.97 acre-feet per year for Ivanpah 1 and about 12 acre-feet per year for Ivanpah 2 and 3. However, the application rate on Ivanpah 1 may double during construction of Ivanpah 3 due to increased amounts of construction- related dust. During each washing, approximately 0.17 gallon per linear foot of mirror would run off onto the ground beneath the mirror.

Maintenance

In addition to regular, day-to-day operation of the ISEGS facility, BrightSource would need to perform a variety of maintenance actions. BrightSource has grouped these anticipated maintenance activities into three classes. Any maintenance activities that are outside the

approved right-of-way boundary (i.e., the fenced boundary of the project site and the associated perimeter road) for the project will require additional authorizations from the Bureau and additional section 7 consultation.

Class I activities are those maintenance actions that do not result in new surface disturbance. BrightSource would perform these activities by hand or with the use of tools, equipment, and/or vehicles. Class I activities would take place on existing structures or would be staged from existing roads or other disturbed areas. These activities would not include off-road travel. Vehicles used during these activities might include low-boy tractor and trailer, flat bed, utility trucks, forklifts, scissor lifts, cherry pickers, and mechanical hoists. Labor may involve several workers confined to the area in need of maintenance. BrightSource may need to perform these activities on a daily basis.

Class II activities would result in minimal surface disturbance, but would likely require heavy earth-moving equipment including motor graders, bulldozers, front-end loaders, backhoes, water trucks, asphalt pavers, and dump trucks. Typical Class II activities would include: 1) underground utility (e.g., water, gas, sewage, electrical, communication, etc.) repairs, upgrades and tie-ins to structures; 2) motor grading and repairs of existing dirt roads, shoulders, and berms; 3) cut or fill of soil surface to re-establish appropriate cover due to soil erosion after rainfall events; 4) maintenance of drainages, fords and culverts for proper flow of water runoff; 5) maintenance of asphalt roads, shoulders and parking lots; 6) security and desert tortoise exclusion fence repairs; and 7) minor natural gas pipeline repairs that require excavation.

Class III includes maintenance activities that result in major surface disturbance. Typical Class III activities would include: 1) installation of a new underground pipeline a distance of 1,000 feet or more and 2) disturbance of an acre or more for construction of new storm water drainage features. Because we do not have sufficient detail regarding Class III maintenance activities, we cannot adequately analyze their potential effects on desert tortoises. Consequently, we are not addressing Class III maintenance activities or any Class II maintenance activities that would occur outside of the fenced project site that are not associated with repair of fencing. The Bureau has indicated that these actions would require future site-specific authorizations. At the time the Bureau considers authorization of these future activities, it will need to determine whether these future activities may affect desert tortoises. Some of these actions may require future site-specific consultation under section 7.

Decommissioning and Restoration

BrightSource would perform restoration work on all sites disturbed during construction, operation, maintenance, and decommissioning of the ISEGS facilities. For short-term disturbances, BrightSource would begin restoration following completion of ground disturbance and would implement the following general steps: 1) decompaction of soils, 2) spreading of topsoil salvaged prior to construction, and 3) seeding of the disturbed area with native plant species. BrightSource would time seeding to avoid drought periods to the extent possible.

Decommissioning of the facility would occur sequentially in the order of construction (i.e., Ivanpah 1, followed by Ivanpah 2, Ivanpah 3, and the shared facilities). Following decommissioning of the ISEGS facility, BrightSource would remove all structures from the project area and begin restoration of all long-term disturbances. Decommissioning and restoration/reclamation would involve the following general activities: 1) rehabilitate access roads by removing asphalt, decompacting soil, and revegetating, 2) remove all structures and foundations less than 6-feet deep from the project area, 3) remove all physical components of the generation facility except for the SCE substation, the diversion structure, and asphalt access road, 4) re-contour and decompact soils associated with disturbed areas, 5) implement revegetation procedures using native species, 6) remove all exclusion and security fencing, and 7) monitor revegetated areas for success and control non-native weeds.

Minimization Measures

General Protective Measures

To minimize adverse effects to the desert tortoise, BrightSource will implement the following protective measures during construction, operation, maintenance, and decommissioning activities. The wording of some measures differs from those proposed by the Bureau and BrightSource. We have changed the wording of some measures to improve clarity, but we have not changed the substance of the measures that BrightSource and the Bureau have proposed.

1. BrightSource will employ authorized biologists, approved by the Service, and desert tortoise monitors to ensure compliance with protective measures for the desert tortoise. Use of authorized biologists and desert tortoise monitors will be in accordance with the most up-to-date Service guidance and will be required for monitoring of any construction, operation, or maintenance activities that may result in take of the desert tortoise. The current guidance is entitled *Desert Tortoise – Authorized Biologist and Monitor Responsibilities and Qualifications* (Service 2008a).

2. BrightSource will provide the credentials of all individuals seeking approval as authorized biologists to the Bureau. The Bureau will review these and provide the credentials of appropriate individuals to the Service for approval at least 30 days prior to the time they must be in the field.

3. BrightSource will designate a field contact representative who will oversee compliance with protective measures during construction, operation, maintenance, and decommissioning activities that may result in injury or mortality of desert tortoises. If the field contact representative, authorized biologist, or desert tortoise monitor identifies a violation of the desert tortoise protective measures, they will halt work until the violation is corrected.

4. Individuals approved to capture and handle desert tortoises (i.e., authorized biologists and supervised desert tortoise monitors) will do so in compliance with the most up-to-date guidance from the Service. The Service is currently using the *Desert Tortoise Field Manual* (Service 2009a).

5. BrightSource will develop and implement an environmental awareness program for all workers (construction, operation, maintenance, and decommissioning) that will address the following: a) types of construction activities that may affect the desert tortoise, b) the required desert tortoise protective measures, c) desert tortoise life history and threats, d) legal protections and penalties, and e) reporting requirements.

6. Bright Source will fence the boundaries of the Ivanpah 1, 2, and 3 project sites, the CLA, and Colosseum Road and clear these areas of all desert tortoises prior to construction. We have provided a description of the procedures for clearance, translocation, and monitoring of these animals below.

7. Authorized biologists will perform clearance surveys of unfenced work areas outside of the main project sites and CLA (e.g., gas distribution line, utility right-of way, etc.) immediately prior to the onset of construction, operation, or maintenance activities.

8. BrightSource will employ an appropriate number of authorized biologists and desert tortoise monitors to monitor construction, operation, maintenance, and decommissioning activities that occur in any unfenced work areas. Authorized biologists or desert tortoise monitors will flag all desert tortoise burrows for avoidance in areas adjacent to construction work areas.

9. BrightSource will confine all construction activities, project vehicles, and equipment within the delineated boundaries of construction areas that authorized biologists or designated desert tortoise monitors have identified and cleared of desert tortoises. BrightSource will confine all work areas to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. BrightSource will use previously disturbed areas to the extent feasible.

10. Any non-emergency expansion of activities into areas outside of the areas considered in this biological opinion will require Bureau approval and desert tortoise clearance surveys. These expanded activities may require re-initiation of consultation with the Service.

11. BrightSource will prohibit project personnel from driving off road or performing ground-disturbing activities outside of designated areas during construction, operation, maintenance, or decommissioning except to deal with emergencies.

12. During operation and maintenance activities at the completed project site, BrightSource will confine all vehicle parking, material stockpiles, and construction-related materials to the permanently fenced project sites and CLA.

13. BrightSource will confine project access to Colosseum Road for construction, operation, maintenance, and decommissioning of the facility. BrightSource will permanently fence this road with desert tortoise exclusion fencing prior to the onset of construction. To reduce the potential for vehicle strikes of desert tortoise on unfenced access roads (i.e., gas line road, fiber optic right-of-way road, etc.), BrightSource will enforce a 20-mile-per-hour speed limit for project related travel (i.e., construction, operation, maintenance, and decommissioning) in these areas. BrightSource will post speed limit signs along all access routes.

14. With the exception of security personnel, BrightSource will prohibit firearms on the project site.

15. Project personnel who are working outside fenced areas will check under vehicles or equipment before moving them. If project personnel encounter a desert tortoise, they will contact an authorized biologist. The desert tortoise will be allowed to move a safe distance away prior to moving the vehicle. Alternatively, an authorized biologist or desert tortoise monitor may move the desert tortoise to a safe location to allow for movement of the vehicle.

16. An authorized biologist or desert tortoise monitor will inspect all excavations that are not within desert tortoise exclusion fencing on a regular basis (several times per day) and immediately prior to filling of the excavation. If project personnel discover a desert tortoise in an open trench, an authorized biologist or desert tortoise monitor will move it to a safe location. BrightSource will cover or temporarily fence excavations that are outside of the permanently fenced project areas at the end of each day to prevent entrapment of desert tortoises during non-work hours.

17. When outside of the fenced project areas, project personnel will not move construction pipes greater than 3 inches in diameter if they are stored less than 8 inches above the ground until they have inspected the pipes to determine the presence of desert tortoises. As an alternative, BrightSource may cap all such structures before storing them outside of fenced area.

Management of Common Ravens

BrightSource will implement the following project design features and protective measures to reduce the adverse effects associated with predation of desert tortoises by common ravens (*Corvus corax*). The draft management plan for common ravens (CH2MHill 2008b) contains more detailed information on the following actions:

1. BrightSource will contain all trash associated with the project that could serve as an attractant to predators in secure, self-closing receptacles to prevent the introduction of anthropogenic food resources for common ravens.

2. BrightSource will promptly remove and dispose of all road-killed animals on the project site or its access roads.

3. BrightSource will use water for construction, operation, maintenance, and decommissioning (e.g., truck washing, dust suppression, heliostat washing, landscaping, etc.) in a manner that does not result in puddling.

4. BrightSource will use closed tanks to store water for all project site water needs to eliminate an open water source for common ravens.

5. BrightSource will use closed tanks to store water associated with boiler commissioning and emergency outfalls. BrightSource will not use storm-water detention basins in its project design.

6. BrightSource will install generation tie-lines on utility poles designed to be incompatible with nesting of common ravens in accordance with Avian Power Line Interaction Committee guidelines (2006) and will monitor the effectiveness of these deterrence measures. BrightSource will implement alternative measures if the current effort is unsuccessful.

7. All transmission lines associated with the ISEGS facility will be designed in a manner that will reduce the likelihood of nesting by common ravens. BrightSource will monitor all utility lines and other potential nesting structures and remove common raven nests that it identifies following authorization by the Bureau and the Service.

8. BrightSource will monitor the ISEGS facilities to identify frequently used perching locations for common ravens. If it identifies such locations, BrightSource will install bird barrier spikes or other functional equivalent following specific discussion with the Bureau and the Service.

9. BrightSource will coordinate with the Bureau and the Service to implement or fund hazing or lethal removal of problem common ravens. Problem common ravens are individuals that have been shown to prey on desert tortoises through monitoring.

10. BrightSource will monitor the effectiveness of its management plan for common ravens during all 3 phases of construction and for 2 years following completion of the final phase. BrightSource will implement adaptive management measures if monitoring shows that the management plan is not effective in controlling common raven use of the

project site. BrightSource will consult with the Bureau and the Service prior to implementing adaptive management changes.

Weed Management

BrightSource will implement the following weed management measures to reduce adverse effects to desert tortoises and their habitat during construction operation and maintenance of the ISEGS facilities:

1. BrightSource will designate an environmental compliance manager to provide oversight of construction practices and ensure compliance with weed management provisions.

2. BrightSource will provide training to all personnel charged with environmental management responsibilities that will include the following: a) weed plant identification, b) impacts of noxious weeds on native vegetation, wildlife, and fire activity, and c) required measures to prevent the spread of noxious weeds on the site.

3. During construction, BrightSource will perform weekly inspections during the growing season of all construction areas, access routes, and equipment cleaning facilities for the presence of noxious weeds and weed seed. Following the completion of construction activities, from March through August, BrightSource will continue monitoring according to the following schedule: 1) once a month during the first 2 years of the revegetation, 2) quarterly for the third and fourth years, and 3) semi-annually for year 5 through 10.

4. During operation of completed facilities, BrightSource will perform general site monitoring according to the schedule described above (Measure 3) and perform weed control at least every other week during the growing season (March through August) and once a month during the remainder of the year. Weed control will consist of physical control methods (e.g., hand pulling, hoeing, etc.) or herbicide application.

5. BrightSource will apply all herbicides used in weed treatments according to a plan approved by the Bureau and in accordance with the herbicide labels. BrightSource will only use qualified individuals for herbicide application and will suspend herbicide use when any of the following conditions are met: a) wind velocity exceeds 6 miles per hour during application of liquids or 15 miles per hour during application of granular herbicides, b) snow or ice covers the foliage of noxious weeds, c) precipitation is occurring or is imminent, or d) air temperatures exceed 90 degrees Fahrenheit.

6. BrightSource will monitor all locations of weed treatment to ensure that treatments are effective.

7. BrightSource will limit disturbance areas during construction to the minimal required to perform work and will only use defined routes when accessing work areas.

8. BrightSource will use vehicle wash and inspection stations and closely monitor all material brought onto the site to minimize the potential for weed introductions.

9. BrightSource will identify and flag all areas of noxious weed infestation and minimize use of these areas by project personnel until weed treatment of the area has occurred.

10. BrightSource will preferentially perform native seed collection for restoration work from areas adjacent to the project site. When it is necessary (i.e., native seed from the surrounding area is not available for collection) to use native seeds from commercial vendors, BrightSource will only accept seed that is free of non-native weed seeds.

Desert Tortoise Translocation

Translocation Activities Performed under the Previous Consultation

Under the previous consultation, BrightSource fenced all portions of Unit 1, the construction logistics area (CLA), Colosseum Road, and portions of Units 2 and 3 with desert tortoise exclusion fencing. In addition, it fenced the access route and central power block of Unit 2. Although BrightSource fenced most of the perimeter of Unit 2, it left gaps in the fence line. In the fall of 2010, BrightSource performed clearance surveys of Unit 1, the CLA, and the power block area of Unit 2.

During fence installation, BrightSource moved desert tortoises out of harm's way if they were within the fence line right-of-way or associated perimeter access route. It attached transmitters to all of these individuals and monitored them to determine if individuals along the fence line were selecting areas inside or outside of the project site. If individuals exhibited a substantial amount of fence pacing behavior (i.e., moving back and forth along the fence in an attempt to get out of the project site), BrightSource placed these individuals outside of the project site. Following completion of fence installation around Unit 1, the CLA, and the power block of Unit 2, BrightSource performed five full clearance sweeps of these areas and placed all individuals encountered into the quarantine facility that it constructed within the CLA. BrightSource performed health assessments, including blood collection, on most of these individuals.

In addition to fencing and clearance activities, BrightSource performed extensive searches of the recipient site, the control site, and Units 2 and 3. During these searches, it attached transmitters to desert tortoises to facilitate post-translocation monitoring and to improve the likelihood of finding Unit 2 and 3 individuals during subsequent clearance surveys. BrightSource also collected blood from and performed health assessments on many of these individuals to determine disease prevalence within the translocation recipient population, as

required by the 2010 biological opinion. In April 2011, BrightSource performed surveys of the proposed recipient sites to determine population density.

Revised Desert Tortoise Translocation Strategy

We have summarized the following description of the revised desert tortoise translocation strategy for the ISEGS project from BrightSource's translocation plan (CH2MHill 2009b) and the Bureau's biological assessment used for re-initiation of consultation (Bureau 2011a). Portions of the revised translocation strategy do not differ from the previous strategy, but we have described the entire proposal for clarity. In cases where BrightSource completed some portions of the strategy under the previous consultation, we have only described the changed actions.

Fencing and Clearance

BrightSource will complete fencing around the boundary of Unit 2 and 3, the Kern River Gas metering station, the expansion of the Unit 2 power block, and the power block and access road for Unit 3 in the summer of 2011. BrightSource will install desert tortoise guards, as described in attachment B of the previous biological assessment (CH2MHill 2009a), at gated entries to prevent desert tortoises from gaining entry to the project site.

Within 24 hours prior to the initiation of construction of the desert tortoise-exclusion fence, BrightSource will conduct 2 complete desert tortoise clearance surveys of the fence line segment and associated disturbance right-of-way that will be fenced that day. During these surveys, an authorized biologist will inspect all burrows to determine occupancy and collapse all unoccupied burrows. To the extent feasible, BrightSource will make modifications in fence alignment to fence occupied burrows out of the ISEGS project areas. If the fence line cannot avoid a given burrow, an authorized biologist will remove the desert tortoise and place it in a sheltered location outside of the ISEGS project area.

Following construction of the desert tortoise exclusion fence around a given portion of the ISEGS project site, BrightSource will perform a clearance survey pass of the fenced area during the spring or fall and excavate all burrows that could house a desert tortoise (including rodent holes). This pass will not count as one of the clearance passes described in the Service's translocation guidance. Following completion of this initial pass, BrightSource will perform a full clearance survey of the fenced area, in accordance with the Service's desert tortoise translocation guidance (Service 2010e). If the Service releases revised guidance on desert tortoise translocation prior to initiation of clearance surveys, BrightSource will perform surveys in accordance with the revised guidance. BrightSource may extend its survey window outside of the times outlined in the Service guidance (i.e., spring and fall) for clearance of the fence line construction around the boundary of Unit 2 and 3, the Kern River Gas metering station, the expansion of the Unit 2 power block, and the power block and access road for Unit 3, which would occur in the summer of 2011. Extension of the survey window will only occur in

accordance with the conditions and criteria outlined in this biological opinion (see *Clearance Surveys during the Summer of 2011*). BrightSource will initially place all desert tortoises or eggs cleared from the fenced project site into the onsite quarantine facility.

Translocation

As discussed previously, BrightSource has completed disease testing of most individuals that it cleared and quarantined from Unit 1, the CLA, and the power block area of Unit 2 under the provisions of the 2010 biological opinion. BrightSource will address the translocation of these animals from the quarantine facility and the translocation of animals from Units 2 and 3 in accordance with the following description.

As stated above, BrightSource will initially place all desert tortoises or eggs cleared from the fenced project site into the onsite quarantine facility to await results of disease testing of the desert tortoises. All individuals will receive health assessments, including blood collection and disease testing in accordance with the Service's translocation guidance. BrightSource will X-ray all female desert tortoises of reproductive age to determine if they are gravid. The period of time that individuals spend in the quarantine facility will vary depending on a variety of factors (i.e., length of time it takes to get disease test results, timing of clearance surveys, environmental conditions within the recipient site, size of the individual, etc.). Some individuals may remain in the quarantine facility for a season prior to final translocation. For example, if clearance surveys occur toward the end of the survey window and BrightSource does not receive disease test results in time to release individuals during the translocation window; these individuals may remain in the quarantine facility until the following active season. In addition, BrightSource will retain gravid females at the quarantine facility until they lay their eggs, so that this reproductive output is not lost. Finally, the Bureau has indicated that translocation would not occur during a drought year and BrightSource would not release smaller individuals until they reach at least 120 millimeters, carapace length (all further desert tortoise measurements in this document refer to the carapace length measurement). Following receipt of disease test results and Service approval of the recipient sites described below, translocation of individuals will proceed according to the procedures outlined below.

The Bureau has identified the revised recipient site as a 2-kilometer area that extends out from the boundaries of the project site, excluding an area to the east of Units 1, 2, and 3 that is currently under a separate right-of-way application (Bureau 2011a, Figure 2-2 and Woodman 2011c). The recipient site would also extend south from Unit 1 to Interstate 15 and along the western edge of Interstate 15 from Yates Well Road to Nipton Road (Bureau 2011a, Figure 2-2 and Woodman 2011c). BrightSource will fence the portion of the recipient site adjacent to Interstate 15 (i.e., permanent desert tortoise exclusion fencing along the interstate and temporary exclusion fencing along the north, south, and east boundaries for a distance of 1 kilometer from the interstate fencing) for a period of approximately 10 years. BrightSource would not release individuals into the recipient sites described above until it has completed fencing of the Interstate 15 recipient site, completed all surveys recommended by the Service's translocation

guidance (i.e., density estimation, disease prevalence, etc.), and received approval for release from the Bureau and the Service.

BrightSource will translocate desert tortoises larger than 120 millimeters that were initially found within 500 meters of an external fence, over that fence except along the eastern boundary of Unit 2 and 3 using all appropriate measures listed below. BrightSource will place these individuals in a similar spatial distribution as they found them on the site. In the remainder of the biological opinion, we have referred to these movements as "within-home-range translocations". BrightSource will place all individuals larger than 120 millimeters that were initially located farther than 500 meters from an external fence line into the fenced recipient site next to Interstate 15 using all appropriate measures listed below. In the remainder of the biological opinion, we have referred to these movements as "outside-home-range translocations".

Improved Juvenile Survival

All individuals smaller than 120 millimeters will remain in the quarantine facility until they reach 120 millimeters or have been captive for a period of 5 years, whichever comes first; any desert tortoises that hatch within the facility will be held for the same period. BrightSource will X-ray all females of reproductive age that come into the quarantine facility and retain gravid individuals until they lay their eggs. Once a cohort of 30 desert tortoises reaches 120 millimeters, BrightSource will release it as a group during the next appropriate translocation season if it is not a drought year. BrightSource will release these cohorts into the recipient site along Interstate 15 unless it is a drought year or monitoring of the translocated adults and the other environmental variables in this location (see below) indicates that this would be inappropriate.

Monitoring

BrightSource will monitor desert tortoises cleared from the IESGS project site in accordance with the Service's current translocation guidance (Service 2010e) or more recent update. The current guidance recommends 5 years of post-release monitoring, but this term may increase in subsequent updates to the guidance. Based on the delayed translocation strategy for some individuals, described above, monitoring would last for at least 10 years following the initial translocation release. BrightSource will attach transmitters to all desert tortoises released into the recipient sites and to an equal number of desert tortoises that are resident to the recipient site to facilitate monitoring. The monitored resident population will mimic the size class distribution of the population that BrightSource would release into the recipient site to the greatest extent possible. If a sufficient number of resident animals cannot be located, BrightSource will transmitter as many animals as it can locate within the resident population. In addition, BrightSource will attach button temperature data loggers to a subset of monitored desert tortoises. To assess the health of the recipient-site population, BrightSource will perform surveys with transects spaced at 10-meter intervals and perform health assessments, including

blood sampling, on all desert tortoises that it encounters. It will perform these health assessments between May 15 and October 31.

BrightSource will also attach transmitters to and monitor desert tortoises in a population that will serve as a control group for translocation monitoring. The control area will be south and east of the project area. Nipton Road, the McCullough Mountains, Interstate 15, and Primm, Nevada, will form the boundaries of the control population. Because Nipton Road does not have desert tortoises exclusion fencing, the perimeter of the proposed control area will be set back 500 meters from this road. BrightSource will perform surveys with transects spaced at 10-meter intervals and perform health assessments, including blood sampling, on all desert tortoises that it encounters. It will perform these health assessments between May 15 and October 31. The monitored control population will mimic the size class distribution of the population that BrightSource would release into the recipient site to the greatest extent possible. BrightSource will establish the control group prior to release of translocated individuals into the recipient sites.

During monitoring, BrightSource will investigate the drivers of post-translocation survival. Specifically, it will investigate the interdependent roles of desert tortoise movement patterns, habitat use, health status, environmental toxicants, road noise and vibration, and physical features (e.g., habitat structure, composition, and fragmentation, soil properties) and processes (e.g., precipitation and temperature gradients) across a focal study landscape (i.e., translocated, recipient, and control populations within Ivanpah Valley). BrightSource will compare the information collected on the movements, home ranges, habitat characteristics, disease prevalence, and survival of the resident and control populations with that collected on translocated desert tortoises. BrightSource will perform health assessments on the monitored populations at least twice per year.

To minimize adverse effects to the desert tortoise, BrightSource will implement the following protective measures when implementing the translocation strategy described above:

1. BrightSource will fence Interstate 15 between Yates Well Road and Nipton Road with desert tortoise exclusion fencing and complete fencing and culvert placement along the Yates Well portion of its access road prior to release of desert tortoises into the recipient sites.

2. BrightSource will fence the recipient site used for outside-home-range translocations with temporary desert tortoise exclusion fencing that will tie into the Interstate 15 fencing. This fenced area will be large enough to accommodate all desert tortoises released into this area at a density of 21 or fewer desert tortoises larger than 160 millimeters per square mile.

3. BrightSource will design all permanent desert tortoise exclusion fencing in accordance with the most up-to-date Service guidance. The Service is currently using guidance provided in the *Desert Tortoise Field Manual* (Service 2009a).

4. BrightSource will ensure that within-home-range recipient sites are large enough to accommodate a post-translocation density of less than 21 desert tortoises larger than 160 millimeters per square mile.

5. To improve the likelihood that BrightSource will locate a high percentage of the desert tortoises on the project site, BrightSource will perform one full clearance pass according to the procedures outlined in the 2010 biological opinion and excavate all burrows that could potentially house a desert tortoise (including rodent burrows). This initial survey will be performed in addition to the other clearance passes required in the 2010 biological opinion. Following this initial coverage, clearance surveys would proceed as described in the 2010 biological opinion. BrightSource will comply with the most up-to-date guidance for performing desert tortoise clearance surveys, handling, and transmitter attachment. The Service is currently using the *Desert Tortoise Field Manual* (Service 2009a) except for the timing of clearance surveys for some portions of the project (see below in *Clearance Surveys during the Summer of 2011*).

6. BrightSource will use authorized biologists for the performance of clearance surveys and for any other activities that require the handling of desert tortoises. If BrightSource uses desert tortoise monitors during clearance surveys or for other activities that require identification of sign or handling of desert tortoises, the monitors will work under the direct supervision of an authorized biologist.

7. BrightSource will perform health assessments, including blood collection and ELISA testing, from a sufficient number of individuals within the recipient site and control site to detect a population disease prevalence of 15 percent.

8. BrightSource will consider ELISA-testing results valid for a period of one year on any individual desert tortoise. BrightSource will coordinate with the Service to determine the necessity for re-testing of individuals based on the circumstances of their quarantine and their proposed plan for disposition of the individual. BrightSource will only draw blood for ELISA testing between May 15 and October 31, when immune systems are most active, to ensure accurate ELISA testing results. If BrightSource can determine the emergence date for an individual desert tortoise, ELISA testing can occur earlier than May 15, but it must occur at least 6 weeks following the desert tortoise's initial emergence date.

9. BrightSource will only use Service-authorized individuals that have experience in collecting blood for ELISA testing and identifying the clinical signs of upper respiratory tract disease, herpes virus, and cutaneous dyskeratosis for the performance of health

assessments. BrightSource will provide the Service with the qualifications of any authorized biologists that it proposes to use to perform health assessments or blood collection on desert tortoises during clearance and translocation activities. BrightSource will provide these qualifications at least 30 days prior to the need for the health assessment and blood collection. These qualifications will include a certification that the individual has completed the Service's health assessment training.

10. BrightSource will send all samples for ELISA to a laboratory qualified to perform these tests.

11. BrightSource will quarantine, perform health assessments, and collect blood for ELISA testing from all desert tortoises that it clears from the fenced project site. Individuals will remain in quarantine until BrightSource receives the results of ELISA testing. This requirement applies to individuals cleared from the fenced project sites but not to individuals moved a short distance out of harm's way along project perimeter fencing or other linear facilities (see Measure 14).

12. Desert tortoises moved a short distance (i.e., less than 30 feet) out of harm's way along a linear feature (including project-site perimeter fencing) will be assessed for clinical signs of disease (see measure 18 for information on how these individuals will be processed). BrightSource will attach a transmitter to these individuals prior to moving them out of harm's way and will monitor their movement patterns until fence installation is complete. If desert tortoises exhibit a substantial amount of fence pacing behavior and are inside the project footprint, BrightSource will move these desert tortoises outside the project footprint, immediately adjacent to the fence that the animal is pacing.

13. Because fencing of Units 2 and 3 will be completed in summer of 2001 , but will not be cleared until Fall 2011, BrightSource will frequently patrol fences to ensure that pacing animals do not succumb to heat related illnesses.

14. BrightSource will only perform clearance surveys during the spring (April 1 to May 31) and fall (September 1 to October 15). It may extend the clearance survey window for some portions of the project outlined in this biological opinion if it receives prior authorization from the Service (see *Clearance Surveys during the Summer of 2011* below). BrightSource will only release cleared desert tortoises into a recipient site during the spring (March 25 to April 15) or early fall (October 1 to October 5).

15. BrightSource will not perform any clearance surveys or translocation activities when the ambient air temperature is above 95 degrees Fahrenheit or is likely to exceed 95 degrees Fahrenheit before completion of handling or processing. BrightSource will not perform any clearance surveys or translocation activities when the ambient air temperature is below 65 degrees Fahrenheit or is anticipated to go below 50 degrees Fahrenheit during

the week after release. BrightSource will measure ambient air temperature in the shade, protected from wind, at a height of 2 inches above the ground surface.

16. BrightSource will assess all desert tortoises on the project site for clinical signs of disease including those along perimeter fence alignments. It will remove and temporarily quarantine any desert tortoises with clinical signs of disease that it encounters on the ISEGS project site. BrightSource will use the descriptions of clinical signs of disease described in the available scientific literature (Berry and Christopher 2001, Origgi et al. 2004, Ritchie 2006; all in CH2MHill 2009a), unless the Service provides more appropriate guidance. BrightSource will contact the Ventura Fish and Wildlife Office within 24 hours of collection of an animal to determine the appropriate disposition of animals showing clinical signs of disease. These animals may require more extensive testing prior to determination of their final disposition.

17. Following receipt of disease testing results for all animals cleared from the project site for translocation, BrightSource will develop disposition plans for each individual desert tortoise that it wishes to release into a recipient site. Disposition plans will articulate the proposed release site (i.e., map coordinates) of each desert tortoise and the complete health assessment for each individual. BrightSource will not release desert tortoises into recipient sites until it has received concurrence with the proposed disposition plan from the Service.

18. BrightSource will not release any desert tortoises into the recipient site that have clinical signs of disease or positive ELISA-test results unless authorized by the Service. Along linear facilities, where BrightSource moves desert tortoises a short distance out of harm's way, it will remove and quarantine any individuals showing clinical signs of disease and contact the Service regarding disposition of these individuals.

19. BrightSource will not release desert tortoises into recipient sites during drought years. If BrightSource needs to move desert tortoises off the project site during a drought year, it will place these individuals into its quarantine facility.

20. Release of desert tortoises into recipient sites will only occur when temperatures range between 65 and 85 degrees Fahrenheit and are not likely to exceed 90 degrees Fahrenheit within 3 hours of release or 95 degrees within one week of release. In addition, release should not occur if forecasted daily low temperatures are lower than 50 degrees Fahrenheit for one week post-release.

21. BrightSource will pre-select release points for each individual desert tortoise within the respective recipient sites and transport individuals to the release points in clean, ventilated containers. If containers are re-used, BrightSource will disinfect these containers using 10 percent household bleach or other solution approved by the Service. BrightSource will hydrate all desert tortoises scheduled for translocation within 12 hours

prior to release.

22. BrightSource will release all individuals at unoccupied shelter sites (i.e., soil burrows, caliche caves, under shrubs).

23. Following clearance of desert tortoises from the fenced project sites, CLA, and utility right-of-way, an authorized biologist will be onsite during initial clearing and grading to move any desert tortoises missed during the initial clearance surveys. If BrightSource identifies a desert tortoise with clinical signs of disease, it will contact the Ventura Fish and Wildlife Office to determine appropriate disposition of the animal.

24. BrightSource will maintain a record of all desert tortoises encountered and translocated during project surveys and monitoring. The record will include the following information for each desert tortoise: the location (narrative, vegetation type, and maps) and dates of observations, burrow data, general conditions and health, measurements, any apparent injuries and state of healing, the location from which it was captured and the location in which it was released, whether animals voided their bladders, diagnostic markings (i.e., identification numbers), results of health assessments, and ELISA-test results.

25. Following release, BrightSource will locate and monitor translocated desert tortoises according to the following frequency: 1) once within 24 hours of release, 2) twice weekly for the first 2 weeks following release, and then 3) once a week from March through November, and 4) once every other week from November through February. BrightSource will monitor individuals that it has attached transmitters to in the recipient and control populations according to the following frequency: 1) once a week from March through November and 2) once every other week from November through February.

26. If a desert tortoise within the project site is exhibiting fence line pacing and seems to be in distress due to adverse conditions, BrightSource will immediately move it to the within-home-range recipient site in accordance with the translocation strategy defined above.

Clearance Surveys during the Summer of 2011

The Bureau proposes to allow BrightSource to proceed with the following activities during the summer of 2011: 1) construction of perimeter security and desert tortoise exclusion fencing around the remaining portions of Unit 2 and 3; 2) construction of the Kern River Gas metering station and gas pipeline; 3) construction of the access road to the Unit 3 power block; and 4) construction activities within Unit 1 and the power block areas of Unit 2 (including the Unit 2 power block expansion) and Unit 3. All of these activities will require the clearance of desert tortoises from project work areas during the less active season for desert tortoises. All

individuals cleared from project work areas would be placed in the on-site quarantine facility. BrightSource would follow the procedures outlined in the Desert Tortoise Field Manual (Service 2009a), except as modified by the following measures:

1. BrightSource will only capture and transport desert tortoises when the temperature is below 95 degrees Fahrenheit, and will not begin handling desert tortoises if the temperature is expected to exceed 95 degrees Fahrenheit prior to completion of clearance related activities for that desert tortoise. If the temperature rises above 95 degrees Fahrenheit after capture, BrightSource will keep the desert tortoise in a climate-controlled environment (see Service 2009a, Chapter 7, for details on handling tortoises in high temperatures). BrightSource will not release desert tortoises into the quarantine facility until the temperature has dropped to 85 degrees Fahrenheit, which may require holding individuals in a climate controlled facility until night.

2. If time and temperature constraints do not allow BrightSource to remove all desert tortoises during daylight hours, it will remove desert tortoises with radio transmitters from the project site after sunset within the temperature constraints. However, BrightSource will conduct all clearance surveys during daylight hours.

3. Following release of individuals into the quarantine facility, BrightSource will continuously monitor quarantine pens when temperatures are above 85 degrees Farenheit. Temperatures should be recorded in each burrow and outside (shaded bulb 5 cm above the ground) several times across the heat of the day to ensure that the burrows are providing adequate thermal buffer.

4. If BrightSource identifies desert tortoises within the quarantine pens that are exhibiting behavior that may lead to overheating, they will take temporary measures to reduce the desert tortoises exposure to high-temperatures (i.e., block the animal into its burrow or place the animal in a climate controlled facility until temperatures drop below 85 degrees Fahrenheit).

5. BrightSource will erect shade structures above each pen to mitigate temperature extremes experienced by desert tortoises.

6. BrightSource will ensure the use of humane climate controlled holding facilities, approved by a qualified veterinarian or Institutional Animal Care and Use Committee. Documentation of the approval of this facility shall be provided to the Service and the Bureau.

7. Bright Source will design and implement a monitoring study to determine how effective the shade structures, mister systems (if deployed), and burrows in holding pens are in providing refuge from high temperatures. Dataloggers will be used for continuous monitoring, and instantaneous read thermometers will also be used. Data will be

gathered for the following: open desert habitat, habitat with shade structure, and habitat with shade and mister. Data loggers will be placed at 2 inches above ground in each of these conditions. Additionally, data loggers will be placed in burrows in general to collect their temperature profiles and, should a tortoise be confined in a burrow, a data logger would be placed inside with the tortoise.

Ivanpah Valley Population Monitoring

Because ISEGS may further fragment populations and further constrict connectivity within the Ivanpah Valley, Brightsource will work with the Bureau and the Service to develop a monitoring program aimed at identifying adverse effects to desert tortoise populations as a result of the ISEGS project relative to changes in demographic and genetic stability of the desert tortoise population and connectivity within the Ivanpah Valley. This monitoring would commence in 2012 and continue for the life of the right-of-way grant. The Bureau and the U.S. Geological Survey, in consultation with the Service, will determine the methodologies employed in this monitoring program. To the extent possible, this monitoring program will build upon the existing monitoring and sampling of desert tortoises translocated as a result of the construction of the proposed project. A control population, with which the affected population will be compared, would be located in Shadow Valley or another area deemed more appropriate by the agencies. The use of study animals with VHF or satellite telemetry or other data loggers may be incorporated or leveraged with animals in the translocation-effectiveness monitoring program.

Results from the monitoring program described above will be used to identify movement obstructions, management problems, and opportunities to maintain a viable population and genetic connectivity through an adaptive management scheme. If a greater than 20 percent change in baseline metrics is detected, an adaptive management program will be implemented to correct the shift (e.g., move the population back towards baseline conditions). By the spring of 2012, the Bureau will prepare an adaptive management framework for how to respond to demographic or genetic impacts (should they occur) is established. At this point, the proposed method to address such impacts is translocation or augmentation of desert tortoises (either from other areas or from existing head start programs). Other methods for correcting demographic or genetic impacts (e.g., project reconfiguration at the end of the 30-year permit term to allow for larger movement corridors, land-use restrictions to reduce or eliminate threats such as recreational use) could be incorporated in the adaptive management framework. If monitoring indicates imbalances are occurring in this area, the Bureau will consult with the Service before renewing the right-of-way permit for the proposed project, which will be up for renewal after 30 years.

Because we do not currently have sufficient detail regarding this monitoring program, we have not analyzed the effects of this program or exempted take associated with the monitoring methodology in this biological opinion. Authorization of take associated with this monitoring scheme would occur through a 10(a)(1)(A) recovery permit, if issuance criteria are met, issued to the primary investigator tasked with implementing the monitoring program.

Compensation

The following information was briefly discussed in the revised biological assessment (CH2MHill 2010a) and clarified with more detail in follow up communications with the Bureau (Fesnock 2010a and 2010b). The Bureau will require BrightSource to compensate for loss of desert tortoise habitat in accordance with the Northern and Eastern Mojave amendment to the California Desert Conservation Area (CDCA) Plan (Bureau 2002). The Bureau will apply a compensation ratio of 1:1, as described in this plan. This compensation will provide for acquisition of up to 3,582 acres of land in the Northeastern Mojave Recovery Unit, or desert tortoise habitat enhancement or rehabilitation activities on existing public land, or some combination of the two. The following is a list of potential habitat enhancement and rehabilitation actions, identified by the Bureau, that could be implemented solely or in combination with land acquisition to fulfill the Bureau's compensation requirements:

1. Install at least 50 miles of desert tortoise exclusion fencing along the following road segments: a) Interstate 15 between Nipton Road and Ivanpah Dry Lake, b) U.S. Highway 95 through Piute Valley from the California-Nevada state line to Goffs Road, c) Nipton Road, between the California-Nevada border and Interstate 15, and d) Ivanpah Road, from Nipton Road through portions of the Mojave National Preserve.
2. Restore habitat, including vertical mulching, of at least 50 routes that the Bureau has designated as closed in the Shadow Valley, Piute Valley, and Ivanpah Valley Desert Wildlife Management Areas.
3. Install three-strand fencing or other suitable fencing around the boundary of the towns of Nipton and Goffs.
4. Remove exotic plant species from areas important to desert tortoises.
5. Identify and clean up destroyed or damaged habitat areas, such as illegal dumpsites and illegal routes, in Shadow Valley, Piute Valley, Ivanpah Valley, and the critical habitat portions of Mojave National Preserve.
6. Fund desert tortoise head start research, if approved by the Service's Desert Tortoise Recovery Office.

The California Energy Commission has already approved the proposed action. In addition to the required compensation described above, the California Energy Commission will require compensation for loss of desert tortoise habitat at a ratio of 2:1. Lands acquired to meet the California Energy Commissions requirements would meet the following criteria:

1. must be as close as possible to the project site,
2. provide good quality habitat for desert tortoises with capacity to regenerate naturally when disturbances are removed,
3. be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency

or a non-governmental organization dedicated to habitat preservation,
4. be connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover,
5. not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible,
6. not be characterized by high densities of invasive species, whether on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration, and
7. not contain hazardous wastes.

To meet land acquisition requirements, BrightSource will either directly purchase lands, or it will deposit funds with the National Fish and Wildlife Foundation (NFWF). If BrightSource chooses to deposit funds with NFWF, a compensation fee will be assessed based on current fair market appraised value for the specific geographic area in which the acquisition occurs. If BrightSource chooses to provide funds to NFWF, the following conditions will be met: 1) funds will be provided prior to project construction, 2) lands will be acquired prior to completion of project construction, and 3) lands will be conserved in perpetuity by a legal mechanism agreed to by the Bureau and California Department of Fish and Game. If BrightSource directly acquires the lands rather than providing funds to NFWF, it will acquire the lands prior to completion of project construction and will conserve these lands in perpetuity through a legal mechanism approved by the Bureau and California Department of Fish and Game.

Regardless of the acquisition method (i.e., directly or through NFWF), BrightSource will establish a management fund for the acquired lands to comply with requirements of the California Endangered Species Act. The management fund will consist of an interest-bearing account (as described in the memorandum of agreement between the Renewable Energy Action Team Agencies and NFWF) with the amount of capital commensurate to generate sufficient interest to fund all monitoring, management, and protection of the acquired lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and other actions designed to protect or improve the habitat values of the acquired lands. A Property Analysis Record (PAR) analysis, or comparable method, will be conducted by BrightSource, the Bureau, and the California Department of Fish and Game to determine the management needs and costs described above, which then will be used to calculate the amount of capital needed for the management fund. The management fund will be held and managed by NFWF or another entity approved by the Bureau, Service, and California Department of Fish and Game.

To mitigate this project's portion of the cumulative effect of increasing the number of common ravens in the desert region, the California Energy Commission will also require BrightSource to contribute $105.00 per acre for the 3,582 acres associated with the project site. These funds will contribute to an account established with NFWF to carry out a regional management for the common raven. This account was established under a memorandum of agreement between

Renewable Energy Action Team agencies (i.e., the Bureau, Service, the California Energy Commission, and the California Department of Fish and Game) and NFWF to manage funds to implement regional common raven management. Activities that would be carried out to reduce common raven predation on desert tortoises include reduction of human-provided attractants (e.g., food, water, sheltering and nesting sites), education and outreach, removal of common ravens and their nests, and evaluation of effectiveness and adaptive management. The total fee for this project of $376,110 will fund the project's portion of the regional raven management. BrightSource will make the payment within six months of final project approval.

Implementing control of common ravens and habitat enhancement and rehabilitation to fulfill some of the Bureau's compensation requirements may result in adverse effects to desert tortoises. These actions will require future site-specific Bureau authorizations and future project-specific consultation. Consequently, we will analyze the adverse effects of these actions in a general way, but cannot provide any site-specific analysis for these future actions in this biological opinion.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 Code of Federal Regulations 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the status of the species, which describes the range-wide condition of the desert tortoise, the factors responsible for that condition, and its survival and recovery needs; (2) the environmental baseline, which analyzes the condition of the desert tortoise in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the desert tortoise; (3) the effects of the action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the desert tortoise; and (4) the cumulative effects, which evaluates the effects of future, non-Federal activities in the action area on the desert tortoise.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the current status of the desert tortoise, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the desert tortoise in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the desert tortoise and the role of the action area in

the survival and recovery of the desert tortoise as the context for evaluation of the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

STATUS OF THE SPECIES

Basic Ecology of the Desert Tortoise

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the Creosote, Shadscale, and Joshua Tree Series of Mojave Desert Scrub, and the Lower Colorado River Valley subdivision of Sonoran Desert Scrub. Optimal habitat has been characterized as creosote bush scrub in areas where precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally occur in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986). Recent range-wide monitoring efforts have consistently documented desert tortoises above 3,000 feet (Service 2006a).

Desert tortoises may spend more time in washes than in flat areas outside of washes; Jennings (1997) notes that, between March 1 and April 30, desert tortoises "spent a disproportionately longer time within hill and washlet strata" and, from May 1 through May 31, hills, washlets, and washes "continued to be important." Jennings' paper does not differentiate between the time desert tortoises spent in hilly areas versus washes and washlets; however, he notes that, although washes and washlets comprised only 10.3 percent of the study area, more than 25 percent of the plant species on which desert tortoises fed were located in these areas. Luckenbach (1982) states that the "banks and berms of washes are preferred places for burrows;" he also recounts an incident in which 15 desert tortoises along 0.12 mile of wash were killed by a flash flood.

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend most of their time during the remainder of the year in burrows, escaping the extreme conditions of the desert; however, recent work has demonstrated that they can be active at any time of the year. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994).

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and perennial vegetation, which is greatly influenced by climatic factors, such as the timing and amount of rainfall, temperatures, and wind (Beatley 1969, 1974, Congdon 1989, Karasov 1989, Polis 1991; all in Avery 1998). In the Mojave Desert, these climatic factors are typically highly variable; this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet consists of a few species (Nagy and Medica 1986 and Jennings 1993 in Avery 1998). Additionally, their preferences can change during the course of a season (Avery 1998) and over several seasons (Esque 1994 in Avery 1998). Possible reasons for desert tortoises to alter their preferences may include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley, desert tortoises consumed primarily green annual plants in spring; they ate cacti and herbaceous perennials once the winter annuals began to disappear. Medica et al. (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when winter annuals were sparse or unavailable.

Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to 15 eggs; most clutches contain 3 to 7 eggs. Desert tortoises generally lay eggs from mid-May to early July, but occasionally as late as October (Ernst et al. 1994). The eggs typically hatch from late August through early October, but the incubation period is fairly constant regardless of the time eggs are laid. At the time of hatching, the desert tortoise has a substantial yolk sac; the yolk can sustain them through the fall and winter months until forage is available in the late winter or early spring. However, neonates will eat if food is available to them at the time of hatching; when food is available, they can reduce their reliance on the yolk sac to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter; these burrows are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants; if appropriate temperatures and rainfall are present, at least some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their size prohibits access to taller plants. As plants grow taller during the spring, some species become inaccessible to small desert tortoises.

Neonate and juvenile desert tortoises require approximately 12 to 16 percent protein content in their diet for proper growth. Desert tortoises, both juveniles and adults, seem to selectively forage for particular species of plants with favorable ratios of water, nitrogen (protein), and potassium. This is because desert tortoises do not readily excrete potassium, so forage with favorable ratios of these nutrients is required to prevent accumulation of excess potassium. The potassium excretion potential model (Oftedal 2001) predicts that, at favorable ratios, the water and nitrogen in forage allow desert tortoises to excrete high concentrations of potentially toxic

potassium, which is abundant in many desert plants. Oftedal (2001) also reports that variation in rainfall and temperatures cause the potassium excretion potential index to change annually and during the course of a plant's growing season. Changes in the type of forage available for desert tortoises can result in a greater abundance of plants with low potassium excretion potential, which are less likely to be selected. Therefore, the changing nutritive quality of plants, combined with their increase in size, further limits the forage available to small desert tortoises to sustain their survival and growth.

In summary, the ecological requirements and behavior of neonate and juvenile desert tortoises are substantially different from those of subadults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adult desert tortoises. They are active earlier in the season. Finally, small desert tortoises rely on smaller annual plants with greater protein content; the smaller plant size allows them to gain access to food and the higher protein content promotes growth.

Legal Status of the Desert Tortoise

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* 32326). In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 *Federal Register* 12178). The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California (55 *Federal Register* 12178).

The Service listed the desert tortoise in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens, collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the Service's listing of this species.

Recovery Plan for the Desert Tortoise

The recovery plan for the desert tortoise (Service 1994) is the basis and key strategy for recovery and delisting of the desert tortoise. The recovery plan divides the range of the desert tortoise into 6 distinct population segments or recovery units and recommends the establishment of 14 desert wildlife management areas throughout the recovery units. Within each desert wildlife management area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The recovery plan also recommends that desert wildlife management areas be designed to follow the accepted concepts of reserve design and be managed to restrict human activities that negatively affect desert tortoises. The delisting criteria

established by the recovery plan are:

1. The population within a recovery unit must exhibit a statistically significant upward trend or remain stationary for at least 25 years;

2. Enough habitat must be protected within a recovery unit or the habitat and desert tortoises must be managed intensively enough to ensure long-term viability;

3. Populations of desert tortoises within each recovery unit must be managed so discrete population growth rates (lambdas) are maintained at or above 1.0;

4. Regulatory mechanisms or land management commitments that provide for long-term protection of desert tortoises and their habitat must be implemented; and

5. The population of the recovery unit is unlikely to need protection under the Endangered Species Act in the foreseeable future.

The recovery plan based its descriptions of the six recovery units on differences in genetics, morphology, behavior, ecology, and habitat use over the range of the Mojave population of the desert tortoise. The recovery plan contains generalized descriptions of the variations in habitat parameters of the recovery units and the behavior and ecology of the desert tortoises that reside in these areas (pages 20 to 22 in Service 1994). The recovery plan (pages 24 to 26 from Service 1994) describes the characteristics of desert tortoises and variances in their habitat, foods, burrow sites, and phenotypes across the range of the listed taxon. Consequently, to capture the full range of phenotypes, use of habitat, and range of behavior of the desert tortoise as a species, conservation of the species across its entire range is essential.

In 2003, the Service established the Desert Tortoise Recovery Plan Assessment Committee, which was composed of scientists familiar with the desert tortoise and other disciplines relevant to the conservation of this species, to assess whether the 1994 recovery plan needed to be revised; the group concluded that the recovery plan was "fundamentally strong but could benefit substantially from modification" by recognition of new patterns of diversity within the Mojave population of the desert tortoise, explicit implementation of the prescriptions in the original recovery plan, greater appreciation of the implications of multiple, simultaneous threats facing desert tortoise populations, and applying recent advances in analytical techniques to desert tortoise recovery (Tracey et al. 2004).

As a result of these recommendations, the Service has released a draft revised recovery plan for public review (Service 2008c). The draft revised recovery plan includes discussions of reducing the number of recovery units to five based on information that has been generated since the release of the original document and of the other recommendations contained in the assessment.

Relationship of Recovery Units, Evolutionary Distinct Populations, Desert Wildlife

Management Areas, Critical Habitat Units, and Areas of Critical Environmental Concern

The recovery plan for the desert tortoise defines a "recovery unit" as "a geographic area harboring an evolutionarily distinct population of the desert tortoise" (Service 1994). Over the years, workers have commonly used the term "recovery unit" in reference to these geographic areas defined in the recovery plan; the term "evolutionarily distinct population" has not been in common use.

The recovery plan (Service 1994) recognized six recovery units or evolutionarily significant units across the range of the listed taxon, based on differences in genetics, morphology, behavior, ecology, and habitat use of the desert tortoises found in these areas. The boundaries between these areas are vaguely defined. In some cases, such as where the Western Mojave Recovery Unit borders the Eastern Mojave Recovery Unit, a long, low-lying, arid valley provides a fairly substantial separation of recovery units. In other areas, such as where the Eastern Mojave Recovery Unit borders the Northern Colorado Recovery Unit, little natural separation exists. Because of the vague boundaries, the acreage of the recovery units has not been quantified.

The recovery plan recommended that land management agencies establish one or more desert wildlife management areas within each recovery unit. The recovery plan recommended that these areas receive reserve-level management to remove or mitigate the effects of the human activities responsible for declines in the number of desert tortoises. As was the case for the recovery units, the recovery plan did not determine precise boundaries for the desert wildlife management areas; the recovery team intended for land management agencies to establish these boundaries, based on the site-specific needs of the desert tortoise. At this time, desert wildlife management areas have been established throughout the range of the desert tortoise.

Based on the recommendations contained in the draft recovery plan for the desert tortoise, the Service designated critical habitat throughout the range of the desert tortoise (59 *Federal Register* 5820). The 14 critical habitat units have defined boundaries and cover specific areas throughout the 6 recovery units.

The Bureau used the boundaries of the critical habitat units and other considerations, such as conflicts in management objectives and more current information, to propose and designate desert wildlife management areas through its land use planning processes. In California, the Bureau also classified these desert wildlife management areas as areas of critical environmental concern, which allows the Bureau to establish management goals for specific resources in defined areas. Through the land use planning process, the Bureau established firm boundaries for the desert wildlife management areas.

Finally, we note that the Department of Defense installations and National Park Service units in the California desert did not establish desert wildlife management areas on their lands. Where the military mission is compatible with management of desert tortoises and their habitat, the

Department of Defense has worked with the Service to conserve desert tortoises and their habitat. Examples of such overlap include the bombing ranges on the Navy's Mojave B and the Chocolate Mountains Aerial Gunnery Ranges; although the target areas are heavily disturbed, most of the surrounding land remains undisturbed. Additionally, the Army has established several areas along the boundaries of Fort Irwin where training with vehicles is prohibited; desert tortoises persist in these areas, which are contiguous with lands off-base. The National Park Service did not establish desert wildlife management areas within the Mojave National Preserve, because the entire preserve is managed at a level that is generally consistent with the spirit and intent of the recovery plan for the desert tortoise.

Methods of Estimating the Number of Desert Tortoises

Before entering into a discussion of the status and trends of the desert tortoise in the Northeastern Mojave Recovery Unit where the proposed action is located, a brief discussion of the methods of estimating the numbers of desert tortoises would be useful. Three primary methods have been widely used: permanent study plots, triangular transects, and line distance sampling.

Generally, permanent study plots are defined areas that are visited at roughly 4-year intervals to determine the numbers of desert tortoises present. Desert tortoises found on these plots during the spring surveys were registered; that is, they were marked so they could be identified individually during subsequent surveys. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise; 15 of these plots were used by the Bureau to monitor desert tortoises on a long-term basis (Berry 1999). Range-wide, 49 plots have been used at one time or another to attempt to monitor desert tortoises (Tracy et al. 2004).

Triangular transects are used to detect sign (i.e., scat, burrows, footprints, etc.) of desert tortoises. The number of sign is then correlated with standard reference sites, such as permanent study plots, to allow workers to estimate the relative abundance of desert tortoises.

The third methodology, line distance sampling, involves walking transects while trying to detect live desert tortoises. Based on the distance of the desert tortoise from the centerline of the transect, the length of the transect, and a calculation of what percentage of the animals in the area were likely to have been above ground and visible to surveyors during the time the transect was walked, an estimation of the density can be made. This density only represents an estimation of the number of desert tortoises that are greater than 180 millimeters (approximately 7 inches) in size, because desert tortoises that are smaller than this size are difficult to detect. Desert tortoises that are larger than this size are typically classified as subadult or adult desert tortoises.

Each of these methods has various strengths and weaknesses. In general, permanent study plots have been used to estimate the status of desert tortoises across large areas over time. Triangular transects were used to assess the density of desert tortoises on specific sites at a point in time;

this method was commonly used to determine how many desert tortoises may be affected by a specific proposed action. In 2001, the Service initiated line distance sampling to estimate the density of desert tortoises in desert wildlife management areas and critical habitat throughout the range.

Tracy et al. (2004) acknowledged, in its assessment of the recovery plan, that determining the number of desert tortoises over large areas is extremely difficult. Desert tortoises spend much of their lives underground or concealed under shrubs, are not very active in years of low rainfall, and are distributed over a wide area in several different types of habitat. Other factors, such as the inability to sample on private lands and rugged terrain, further complicate sampling efforts. Consequently, the topic of determining the best way to estimate the abundance of desert tortoises has generated many discussions over the years. As a result of this difficulty, estimations of the density of desert tortoises in each recovery unit or desert wildlife management area often reflect inconsistencies in the way in which data were gathered.

Given the difficulty in determining the density of desert tortoises over large areas, the differences in density estimates in the recovery plan and those derived from subsequent sampling efforts may not accurately reflect on-the-ground conditions. However, the absence of live desert tortoises and the presence of carcasses over large areas of some desert wildlife management areas provide an indication that desert tortoise populations seem to be in a downward trend in some regions.

Status and Trends of Desert Tortoise Population in the Northeastern Mojave Recovery Unit

The following paragraphs provide general information on the status and trends of the desert tortoise population in the Northeastern Mojave Recovery Unit, where the proposed action is located. We have not included detailed information on the status of the desert tortoise in the other recovery units throughout the range of the species in this biological opinion. This omission will not compromise the analysis in the biological opinion because our determination regarding whether a proposed action is likely to jeopardize the continued existence of a species must be conducted at the level of the listed taxon. When the range of the listed taxon is divided into recovery units, our level of analysis begins with the recovery unit; if the effects of the proposed action have the potential to compromise the ability of the species to survive and recover within the recovery unit, the next level of analysis considers how the compromised recovery unit would affect the listed taxon throughout its range (Service 2005a). Our analysis can therefore be conducted in a comprehensive manner through an iterative process. The Northeastern Mojave Recovery Unit comprises one of six recovery units for the desert tortoise; consequently, our level of analysis in this biological opinion will begin at this level.

The table below summarizes the population density information from the 1994 desert tortoise recovery plan (Service 1994) and the population density information collected through the Service's range-wide monitoring program (Service 2009b, 2010f, 2010g). Because sampling

intensity varies from year to year based on funding, annual variation in density estimates is likely a reflection of the survey effort in a given year and not necessarily a result of changes in population size. Consequently, we can more accurately estimate recovery unit density by averaging the years 2001 to 2010. In this manner, we estimate a recovery unit density of 7.5 desert tortoises per square mile. However, this density only applies to the areas that the Service actually samples through range-wide monitoring (i.e., critical habitat units and other desert tortoise conservation areas), and it is not reflective of the true density across all portions of the recovery unit. Desert tortoise densities in many areas outside of critical habitat and other desert tortoise conservation areas likely do not have densities of this size due to the greater effects of human disturbance in these unprotected areas.

Desert Wildlife Management Area (DWMA)	Density Estimates (desert tortoises per square mile)									
	1994 Recovery Plan	2001	2002	2003	2004	2005	2007	2008	2009	2010
Northeastern Mojave Recovery Unit		**6.2**	**-**	**9.6**	**-**	**-**	**4.4**	**-**	**8.8**	**8.3**
Beaver Dam Slope DWMA	5 to 60	14.5	-	-	-	2.3	3.1	2.9	8.3	8.6
Gold Butte-Pakoon DWMA	5 to 60	3.1	-	4.7	1.8	0.52	3.1	0	5.7	4.7
Mormon Mesa DWMA	40 to 90	4.7	-	9.9	6	12.7	8.6	4.9	18.9	14.3
Coyote Springs DWMA	up to 90	5.7	9.1	14.2	3.4	8.6	3.7	3.1	5.2	9.4
Ivanpah Critical Habitat Unit	5 to 250	7.3	14	-	12.2	11.9	16.9	18.4	10.4	2.9

The following table summarizes the estimated number of desert tortoises in the desert wildlife management areas in the Northeastern Mojave Recovery Unit, based on the Service's range-wide monitoring program (Service 2010f, 2010g).

Desert Wildlife Management Area	Population Abundance		
	2008	2009	2010
Northeastern Mojave Recovery Unit	-	-	-
Beaver Dam Slope DWMA	778 (295-2047)	2251 (902-5621)	2323 (1342-4019)
Gold Butte-Pakoon DWMA	-	3284 (1287-8379)	2640 (1327-5250)
Mormon Mesa DWMA	1521 (737-3136)	5954 (2903-12210)	4486 (2976-6759)
Coyote Springs DWMA	1180 (658-2117)	1847 (921-3703)	3412 (2132-5460)

Ivanpah Critical Habitat Unit	16301 (6143-43248)	9272 (3990-21547)	2622 (1075-6390)

Based on the work by Nussear et al. (2009), we calculated that the Northeastern Mojave Recovery Unit contained approximately 7,583 square miles of modeled desert tortoise habitat in the 2010 biological opinion (Service 2010d). Because the model does not take into account existing human disturbance, we used data on highly converted lands from The Nature Conservancy's ecoregional assessment (Randall et al. 2010) to remove areas from which desert tortoises are known to be extirpated (e.g., Las Vegas, Pahrump, etc.) and to characterize the amount of remaining habitat that is currently degraded by human impacts. Based on this analysis, we estimate that the Northeastern Mojave Recovery Unit contains approximately 6,916 square miles of habitat with the potential to support desert tortoises in the absence of habitat degradation (Waln 2011a). In addition, wildfire burned approximately 470 square miles of desert tortoise habitat in the Northeastern Mojave Recovery Unit in 2005 (Burroughs 2005). Therefore, we estimate that approximately 6,400 square miles of modeled desert tortoise habitat remains in the recovery unit. Of this total, moderately degraded habitat, which Randall et al. (2010) define as lands that are fragmented by roads or off-road vehicle trails or are in close proximity to urban, agricultural, or other developments, comprises approximately 850 square miles (Waln 2011b); these areas likely contain lower density populations than the habitat historically supported. These estimates likely overstate the amount of extant desert tortoise habitat because the Randall et al. (2010) data on human disturbance are mapped at a coarse scale that does not allow for analysis of smaller scale disturbances and do not take into account spatially explicit information on threats, such as invasive species, that can also degrade habitat.

A kernel analysis was conducted in 2003 and 2004 for the desert tortoise (Tracy et al. 2004) as part of the reassessment of the 1994 recovery plan. The kernel analyses revealed several areas in which live desert tortoises and carcasses did not overlap. The pattern of non-overlapping kernels that is of greatest concern is those in which large areas encompassed carcasses but not live animals. These regions represent areas within desert wildlife management areas (DWMAs) where recent die-offs or declines in desert tortoise populations likely occurred. The kernel analyses indicated large areas in the Piute-Eldorado Valley where carcasses were found but no live desert tortoises. For this entire area in 2001, workers found 6 live and 15 dead desert tortoises found along 103 miles of transects, resulting in a live encounter rate of 0.06 desert tortoise per mile of transect for this area. This encounter rate was among the lowest that year for any of the areas sampled in the range of the Mojave desert tortoise (Tracy et al. 2004).

Results of desert tortoise surveys at three survey plots in Arizona indicate that all three sites have experienced significant die-offs. Six live desert tortoises were located in a 2001 survey of the Beaver Dam Slope exclosure plot (Walker and Woodman 2001). Three had definitive signs of upper respiratory tract disease, and two of those animals also had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 31 live desert tortoises in 1996, 20 in 1989, and 19 in 1980. The 2001 survey report indicated that a reproductively viable population of desert tortoises likely no longer persisted on this study plot. Thirty-seven live desert tortoises were located in a 2002 survey of the Littlefield plot (Young et al. 2002). None

had definitive signs of upper respiratory tract disease. Twenty-three desert tortoises had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 80 live desert tortoises in 1998 and 46 live desert tortoises in 1993. The survey report indicated that the site might be in the middle of a die-off due to the high number of carcasses found since the site was last surveyed in 1998. Nine live desert tortoises were located during the mark phase of a 2003 survey of the Virgin Slope Plot (Goodlett and Woodman 2003). The surveyors determined that the confidence intervals of the population estimate would be excessively wide and not lead to an accurate population estimate, so the recapture phase was not conducted. One desert tortoise had definitive signs of upper respiratory tract disease. Seven desert tortoises had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 41 live desert tortoises in 1997 and 15 live desert tortoises in 1992. The survey report indicated that the site may be at the end of a die-off that began around 1996 or 1997.

Nussear et al. (2009) modeled desert tortoise habitat across the range of the desert tortoise. This model, which is based on 3,753 desert tortoise locations, uses 16 environmental variables, such as precipitation, geology, vegetation, and slope. In addition, Nussear et al. used 938 additional occurrence locations to test the model's accuracy. Using this model, we estimate that the Northern and Eastern Mojave Recovery Unit contains approximately 4,853,368 acres of potential desert tortoise habitat (Darst 2010). Although this analysis likely omits some marginal desert tortoise habitat, it explains the occurrence of 95 percent of the 938 test points used in the Nussear et al. (2009) model. This modeling and mapping analysis does not consider habitat loss, fragmentation, or degradation associated with human-caused impacts; however, it provides a reference point relative to the amount of desert tortoise habitat within the Northeastern Mojave Recovery Unit.

Fires, Drought, and Non-native Plants

In the previous section, we mentioned that, in 2005, fires burned approximately 470 square miles of the Northeastern Mojave Recovery Unit. The fires adversely affected the status of the desert tortoise by reducing the number of individuals (i.e., desert tortoises killed by the fire), possibly by reducing reproductive rates (i.e., desert tortoises in burned areas may have lower reproductive rates because of the decreased value of the habitat), and by degrading a portion of the habitat available to the species.

In addition, drought has been implicated as a factor in reduced survival rates on desert tortoises in local areas (Longshore et al. 2003). In this 9-year study, researchers compared 2 "closely situated, but physiographically different, sites" in the Lake Mead National Recreation Area, Nevada. After a period during which survival rates were stable, the survival rate decreased on one of the sites that experienced drought conditions in 3 out of 4 years. The authors postulate that if such local incidents occur on a regular basis, "source-sink population dynamics may be an important factor" in determining the density of desert tortoise populations.

Finally, we have included the following paragraphs from the revised draft recovery plan for the

desert tortoise (Service 2008c) as a general discussion of threats the desert tortoise faces with regard to the anthropogenic factors that affect their ability to meet their nutritional needs. All references are in the draft recovery plan (i.e., in Service 2008c); we have omitted some areas where the level of detail in the draft recovery plan was unnecessary for the current discussion.

Surface disturbance from off-highway vehicle activity can cause erosion and large amounts of dust to be discharged into the air. Recent studies on surface dust impacts on gas exchanges in Mojave Desert shrubs showed that plants encrusted by dust have reduced photosynthesis and decreased water-use efficiency, which may decrease primary production during seasons when photosynthesis occurs (Sharifi et al. 1997). Sharifi et al. (1997) also showed reduction in maximum leaf conductance, transpiration, and water-use efficiency due to dust. Leaf and stem temperatures were also shown to be higher in plants with leaf-surface dust. These effects may also impact desert annuals, an important food source for (desert) tortoises.

Off-highway vehicle activity can also disturb fragile cyanobacterial-lichen soil crusts, a dominant source of nitrogen in desert ecosystems (Belnap 1996). Belnap (1996) showed that anthropogenic surface disturbances may have serious implications for nitrogen budgets in cold desert ecosystems, and this may also hold true for the hot deserts that (desert) tortoises occupy. Soil crusts also appear to be an important source of water for plants, as crusts were shown to have 53 percent greater volumetric water content than bare soils during the late fall when winter annuals are becoming established (DeFalco et al. 2001). DeFalco et al. (2001) found that non-native plant species comprised greater shoot biomass on crusted soils than native species, which demonstrates their ability to exploit available nutrient and water resources. Once the soil crusts are disturbed, non-native plants may colonize, become established, and out-compete native perennial and annual plant species (DeFalco et al. 2001, D'Antonio and Vitousek 1992). Invasion of non-native plants can affect the quality and quantity of plant foods available to desert tortoises. Increased presence of invasive plants can also contribute to increased fire frequency.

Proliferation of invasive plants is increasing in the Mojave and Sonoran deserts and is recognized as a significant threat to desert tortoise habitat. Many species of non-native plants from Europe and Asia have become common to abundant in some areas, particularly where disturbance has occurred and is ongoing. As non-native plant species become established, native perennial and annual plant species may decrease, diminish, or die out (D'Antonio and Vitousek 1992).

Land managers and field scientists identified 116 species of non-native plants in the Mojave and Colorado deserts (Brooks and Esque 2002).

Increased levels of atmospheric pollution and nitrogen deposition related to increased human presence and combustion of fossil fuels can cause increased levels of soil nitrogen, which in turn may result in significant changes in plant communities (Aber et al. 1989). Many of the

non-native annual plant taxa in the Mojave region evolved in more fertile Mediterranean regions and benefit from increased levels of soil nitrogen, which gives them a competitive edge over native annuals. Studies at three sites within the central, southern, and western Mojave Desert indicated that increased levels of soil nitrogen can increase the dominance of non-native annual plants and promote the invasion of new species in desert regions. Furthermore, increased dominance by non-native annuals may decrease the diversity of native annual plants, and increased biomass of non-native annual grasses may increase fire frequency (Brooks 2003).

Nutritional intake affects growth rates in juvenile desert tortoises (Medica et al. 1975) and female reproductive output (Turner et al. 1986, 1987; Henen 1992). Invasion of non-native plants can affect the quality and quantity of plant foods available to desert tortoises, and thereby affect nutritional intake. Desert tortoises are generally quite selective in their choices of foods (Burge 1977; Nagy and Medica 1986; Turner et al. 1987; Avery 1992; Henen 1992; Jennings 1992, 1993; Esque 1992, 1994), and in some areas the preferences are clearly for native plants over the weedy non-natives.

As native plants are displaced by non-native invasive species in some areas of the Mojave Desert, non-native plants can be a necessary food source for some desert tortoises. However, non-native plants may not be as nutritious as native plants. Recent studies have shown that calcium and phosphorus availability are higher in forbs than in grasses and that desert tortoises lose phosphorus when feeding on grasses but gain phosphorus when eating forbs (Hazard et al. 2002). Nagy et al. (1998), in a comparative study on the nutritional qualities of native vs. nonnative grasses and forbs commonly consumed by desert tortoises (*Achnatherum hymenoides* [Indian ricegrass] vs. *Schismus barbatus*; *Malacothrix* spp. [desert dandelion] vs. *Erodium cicutarium*), found that the nutritional value of the two grasses was similar, but both grasses had much lower nutritional value than the forbs. This suggests that the proliferation of non-native grasses such as *Schismus* to the exclusion of native forbs and other plants (D'Antonio and Vitousek 1992) places desert tortoises at a nutritional disadvantage. Furthermore, if (desert) tortoises consume just enough food to satisfy their energy needs (as commonly noted in other vertebrate groups), then the native forbs provide significantly more nitrogen and water than the non-native forbs (Nagy et al. 1998).

Changes in the abundance and distribution of native plants also may affect desert tortoises in more subtle ways. In the Mojave Desert, many food plants are high in potassium (Minnich 1979), which is difficult for desert tortoises to excrete due to the lack of salt glands that are found in other reptilian herbivores such as chuckwallas (*Sauromalus obesus*) and desert iguanas (*Dipsosaurus dorsalis*) (Minnich 1970; Nagy 1972). Reptiles are also unable to produce osmotically concentrated urine, which further complicates the ability for desert tortoises to expel excess potassium (Oftedal and Allen 1996). Oftedal (2002) suggested that desert tortoises may be vulnerable to upper respiratory tract disease or other diseases due to their need to obtain sufficient water and nitrogen from food plants to counteract the negative effects of dietary

potassium. Only high quality food plants (as expressed by the Potassium Excretion Potential, or PEP, index) allow substantial storage of protein (nitrogen) that is used for growth and reproduction, or to sustain the animals during drought. Non-native, annual grasses have lower PEP indices than most native forbs (Oftedal 2002; Oftedal et al. 2002). Foraging studies have demonstrated that juvenile Mojave tortoises are highly selective while foraging, selecting both the plant species and plant parts that are have the highest PEP value. Impacts to vegetation (such as livestock grazing, invasion of non-native plants, and soil disturbance) that reduce the abundance and distribution of high PEP plants may result in additional challenges for foraging desert tortoises (Oftedal et al. 2002).

ENVIRONMENTAL BASELINE

Action Area

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this biological opinion, we consider the action area to include the southern portion of Ivanpah Valley. Specifically, it includes the 3,454-acre-acre project site, the 9,475-acre within-home-range recipient site, the 1,273-acre outside-home-range recipient site, the 50,000-acre control site, and areas along Colosseum Road, the gas line, and the fiber optic line. The action area also encompasses all contiguous desert tortoise habitat in the southern Ivanpah Valley from just north of the state line south to the vicinity of Cima, California (Croft 2011a). This area includes all areas to which desert tortoises may move following translocation and areas that would be potentially vulnerable to fragmentation of the local population. The action area defined for this biological opinion is approximately 330 square miles (Croft 2011a).

Habitat Characteristics of the Action Area

In the 2010 biological opinion, we summarized information on vegetation types for the project site, natural gas distribution line, fiber optic line, Colosseum Road, and the previously proposed recipient sites. The information in the following paragraph provides the discussion of habitat characteristics from the 2010 biological opinion (Service 2010d) and the remaining portion of this section provides information from vegetation surveys of the project site and recipient sites that BrightSource performed in the spring of 2011 (Solar Partners 2011).

All portions of the project site and recipient sites are located on a large, alluvial fan that slopes eastward from the Clark Mountains to Ivanpah Dry Lake at a 3 to 5 percent grade. Numerous ephemeral washes dissect the ISEGS project site with active channels up to 15 feet wide. Elevations within the ISEGS project site range from 2,850 to 3,150 feet above sea level. Elevations along the route of the fiber optic line range from 2,850 feet to 5,320 feet. Creosote bush scrub is the dominant vegetation type on the ISEGS project site, recipient site, Colosseum Road, and the lower elevation portions of the fiber-optic line. Mojave wash scrub also occurs

on the ISEGS project site. Vegetation at higher elevations along the fiber optic line is characterized by blackbrush (*Coleogyne ramosissima*), Joshua trees (*Yucca brevifolia*), Utah juniper (*Juniperus osteosperma*), single-leaf pinyon (*Pinus monophylla*), and Mormon tea (*Ephedra* sp.).

In the spring of 2011, BrightSource performed plant surveys of the project site and the recipient sites described under the revised translocation strategy. The following information summarizes the results of these surveys (Solar Partners 2011). Creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) comprises 77 to 86 percent of the perennial plant composition across the project site and the recipient sites. Cheesebush (*Hymenoclea salsola*) and range ratany (*Krameria erecta*) make up most of the remaining cover and both are present in greater than one percent on all sites. Several other perennial shrub species are present, but none comprises more than one percent of the total perennial cover. All portions of the ISEGS project site and the recipient sites are composed of a creosote and white bursage plant community with high variability in annual plant cover across these areas.

In addition to perennial plant cover, Solar Partners (2011) assessed the botanical species richness of the project site and recipient sites and observed higher species richness on the recipient sites than on the project sites and higher species richness on Unit 3 than on Units 1 and 2. Finally, the 2011 surveys collected data on annual plant cover within the project site and recipient sites (Solar Partners 2011). These surveys found that annual plant cover and cover of important desert tortoise forage (i.e., those having a high potassium excretion potential) are similar between the project site and recipient sites for Units 1, 2, and 3. However, the southern portion of the Interstate 15 recipient site has lower cover of annual plants and important forage species than the project site and other recipient sites.

We do not have specific plant survey information for the remaining portions of the action area. However, all portions of the action area contain habitat features that the U.S. Geological Survey has mapped as conducive to desert tortoise occupancy (Nussear et al. 2009).

Existing Conditions in the Action Area

The region described in the Environmental Baseline - Action Area section of this biological opinion begins in the southern end of Ivanpah Valley, where the Ivanpah Mountains to the north and the New York Mountains to the south converge and the valley begins to merge into higher elevation habitat at the edge of Cima Dome. In the north, the action area ends where the Lucy Gray Mountains to the east, the Spring Mountains to the west, and the northern end of Ivanpah Dry Lake converge. The western edge of the action area is bounded by the New York and Clark mountains from south to north; the eastern edge is bounded by the Ivanpah and Lucy Gray mountains from south to north.

In this section, we discuss the anthropogenic and natural conditions in the action area as they relate to the desert tortoises and their habitat. Unless we have noted otherwise by citing a

biological opinion, the anthropogenic conditions present in the action area were constructed or instituted prior to the listing of the desert tortoise.

Terrain

The predominant natural feature in the valley is a large wash complex that flows from Cima Dome in the south to the southern end of Ivanpah Dry Lake to the north. The dry lake then extends to the northern edge of the action area. The dry lake does not provide habitat to desert tortoises because of its fine, compacted substrate and lack of most perennial and annual plants species. Although Ivanpah Dry Lake does not present a complete barrier to the movement of desert tortoises, we expect that they attempt to cross it only infrequently, because of the almost total lack of cover.

The Clark, Lucy Gray, New York, and Ivanpah mountains encircle most of Ivanpah Valley and form natural barriers to the movement of desert tortoises. They are higher in elevation and steeper than most areas where desert tortoises normally reside, although, on rare occasions, individuals are found much farther up mountain slopes that would normally be expected. Cima Dome, at the southern end of the valley, is higher in elevation than areas in which desert tortoises usually occur but its gentler slope would allow them to access it easily, if they attempted to do so.

Alluvial fans cover most of the area between Ivanpah Dry Lake and the mountains. The alluvial fans provide most of the areas of suitable habitat for desert tortoises. They support the plant communities where desert tortoises find food and shelter, generally suitable substrates in which desert tortoises can burrow, and numerous washes. Plant communities on alluvial fans are generally diverse.

As the alluvial fans near Ivanpah Dry Lake, the terrain generally becomes flatter. Because of the more gradual slope, the substrate is generally composed of finer materials, such as clay and silt, and is less suitable for burrowing by desert tortoises. The dominant shrubs are those that are able to tolerant the finer (and occasionally, more salty) substrate; in general, saltbush species (*Atriplex* spp.) are the most common perennial species and often form communities that are less diverse than higher on the alluvial fan. In general, the saltbush communities at the edge of dry lake beds do not provide the most optimal habitat for desert tortoises.

Land Management

Most land in the action area is owned by the Federal government. The State of California owns a few sections in Ivanpah Valley in California and a few small areas are privately owned.

The main areas of privately owned land are the Primm Valley Golf Course and the communities of Nipton, California, and Primm, Nevada. A few other residences are scattered around the valley, primarily to the west of Nipton along Nipton Road.

The Primm Valley Golf Course occupies approximately 0.75 square mile immediately adjacent to Interstate 15 just south of the dry lake. The development of this course removed all habitat value for desert tortoises from this area. Desert tortoises were not detected during surveys for this proposed development (Bransfield 2011); the proximity of the site to Interstate 15 and the dry lake bed may be responsible for this result.

The community of Nipton lies at the junction of Nipton Road and the Union Pacific Railroad line. This small town (approximately 0.5 mile long by 0.25 mile wide) is primarily a tourist destination. All habitat for desert tortoises has been removed from this area.

The community of Primm is a highly developed tourist and gambling area located immediately on the state line. This community is approximately 0.85 mile long by 0.5 mile wide. All habitat for desert tortoises has been removed from this area.

In addition to the habitat that has been directly disturbed as a result of the development of these areas, we expect that desert tortoise habitat immediately adjacent to these areas is somewhat degraded. We cannot assess how far these indirect effects extend from each community; however, because of the greater level of disturbance at the site, we expect that Primm likely affects more surrounding habitat than the other two developments.

The National Park Service manages the southernmost portion of the Ivanpah Valley, from the southern end of the valley where it begins at Cima Dome to the south side of Nipton Road. The Service issued a biological opinion regarding the effects of the management of Mojave National Preserve on the desert tortoise and its critical habitat on July 6, 2001 (Service 2001); in this biological opinion, we concluded that the proposed management of the preserve was not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify its critical habitat because most of the proposed actions would improve the condition of habitat within the Mojave National Preserve and reduce the level of mortality of desert tortoises.

Except for the State and private lands mentioned previously in this section, the Bureau manages the remainder of the land in the Ivanpah Valley. Most of the land north of the Mojave National Preserve and south and east of Interstate 15 lie within the Ivanpah Desert Wildlife Management Area; the Bureau manages these lands for conservation of the desert tortoises. We issued a biological opinion regarding the Bureau's land use plan for this area in which we determined that the Bureau's proposed management was not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify its critical habitat because most of the proposed actions would improve the condition of habitat within the desert wildlife management area and reduce the level of mortality of desert tortoises (Service 2002a). For both the National Park Service's and Bureau's land use plans, we concluded that relatively few desert tortoises were likely to be killed or injured on an annual basis because of the ongoing casual use of these areas.

The remainder of the Bureau's lands in the valley are not managed to ensure the long-term conservation of the desert tortoise. In general, the public's ability to conduct casual use with regard to mining and recreation in these areas is greater than in the desert wildlife management area; additionally, the Bureau will entertain proposals for larger scale projects in such areas, such as renewable energy projects. Consequently, the desert tortoises are generally at higher risk of injury or mortality in these areas. In Nevada, most of the Bureau's lands in the action area are within the Jean-Roach Special Recreation Management Area. The Bureau issues special use permits to organized high-speed racing events in this area that include hundreds of racing and spectator vehicles per event (Service 2010i). We expect that these events likely result in the death or injury of desert tortoises on occasion; we do not have definitive information on their effect of the regional density of desert tortoises but expect that they have led to an overall decrease in the number of individuals in this area.

Use by Feral and Domestic Livestock

Livestock grazing in the Mojave Desert began long before the listing of the desert tortoise. After the desert tortoise was listed (and critical habitat designated), the Bureau and Service consulted on the effects of grazing on several occasions (Service 1993, 1994b). Most recently, the biological opinion for the California Desert Conservation Area Plan amendment for this area discussed the potential effects of cattle and burro grazing on desert tortoises and their habitat (Service 2005b).

In general, cattle grazing affects desert tortoises in several ways. Desert tortoises can be killed or injured during the construction, maintenance, and use of range improvements. Cattle have trampled desert tortoises. They also damage or destroy the burrows of desert tortoises. Predators, such as common ravens, can be attracted to livestock waters, carcasses of livestock, and some range improvements; predators attracted to these features could feed on desert tortoises. Cattle grazing affects habitat of the desert tortoise by disturbing substrates and their crusts, grazing and trampling of shrubs and annual plants, and introducing and spreading weeds. Effects to desert tortoises and their habitat are most pronounced near range improvements (i.e., corrals, water tanks, etc.).

The portion of the action area west of Interstate 15 is within a Bureau-managed cattle grazing allotment (Clark Mountain) and a wild burro herd management area (Bureau and CEC 2009, Bureau 2002). Burros affect desert tortoise habitat in much the same manner as cattle; to some extent, their effects on habitat (e.g., browsing and trampling of shrubs, crushing of burrows, consumption of annual plants, disturbance of soil crusts, etc.) may be more severe locally than cattle because large numbers often tend to congregate in smaller areas. In 2007, the Bureau removed most wild burros from the herd management area (Bureau and CEC 2009). However, given the recent nature of this removal and the persistence of some burros within the action area, adverse effects to habitat are likely to persist to some degree. The extent to which these adverse effects persist is likely a function of at least two factors. First, years of average or above-average rainfall likely speed the recovery of the plant community that is damaged by past

use. Second, the Bureau rarely is able to capture all burros in an area and the remaining burros soon begin to repopulate an area; therefore, the number of burros left after the capture and their rate of reproduction also affects the degree of recovery. We do not have information on the current condition of the burro herd in this area.

In the action area in Nevada, the Jean Lake Allotment was retired in 2006; this allotment covered the portion of Ivanpah Valley east of the railroad line. In California, the Jean Lake Allotment extends from the state line partially into the valley. Although it is considered an active allotment, it has been in non-use status for many years. All allotments in the portion of the Ivanpah Valley within Mojave National Park have been retired. The effects of cattle grazing on desert tortoises and their habitat varies with the intensity of grazing, the time since an area was last grazed, weather conditions, and the type of habitat. We do not have quantitative information on the condition of habitat in the action area with relation to use by cattle; however, even in areas where cattle grazing has not occurred for decades, non-native plants persist and heavily used areas near range improvements exhibit visible disturbance.

Non-native Species

During surveys of the project site, BrightSource identified numerous non-native plant species, such as Sahara mustard (*Brassica tournefortii*), salt cedar (*Tamarix ramosissima*), red brome (*Bromus madritensis*), Mediterranean grass (*Schismus* spp.), London rocket (*Sisymbrium irio*), and red-stemmed filaree (*Erodium cicutarium*) (CH2MHill 2009a, CH2MHill 2008c). Surveyors located red brome, red-stemmed filaree, and Mediterranean grass throughout the project site with Mediterranean grass having a patchy distribution (CH2MHill 2008c). These species likely occur throughout the remainder of the action area; however, we expect the abundance of these species to be lower in portions of the action area that have not experienced cattle grazing in recent years. The abundance and diversity of non-native species in any area vary in relation to the seasonal weather; consequently, the composition of the non-native plant flora may be substantially different from year to year. An overabundance of weedy species likely compromises the nutritional status of desert tortoises, as we discussed in the Status of the Species section of this biological opinion. We do not have specific information on the distribution of non-native species nor on their specific effects on desert tortoises in the action area.

Paved and Unpaved Roads

Interstate 15 crosses the northwestern portion of Ivanpah Valley and divides it into a larger southeastern portion and a much smaller northern portion. The construction of Interstate 15 resulted in the loss of hundreds of acres of habitat and the likely degradation of additional areas as sheet flow across the valley's alluvial fans was disrupted. We also expect that desert tortoise densities adjacent to the freeway are depressed, as discussed by Hoff and Marlow (2002) but we are not aware of surveys that quantify this effect.

Interstate 15 is mostly an impermeable barrier to movement of desert tortoises. The freeway is wide enough and traffic heavy enough that desert tortoises are highly unlikely to travel across its four lanes without being struck; we anticipate that at least a few desert tortoises are killed on this road annually. In Nevada, the Interstate is fenced with desert tortoise exclusion fencing that only allows passage of individuals at culverts and bridges. Fencing to exclude desert tortoises from the California portion of Interstate 15 will be installed as a result of projects proposed by the California Department of Transportation (Service 2006c and the Bureau (i.e., for the ISEGS project).

In the Nevada section of the freeway, a few culverts may allow desert tortoises to cross under the freeway; however, due to the proximity of these culverts near the development of Primm and near Roach Dry Lake (just to the north of Primm), desert tortoises may not use them frequently. In California, two undercrossings south of the golf course will allow desert tortoises to cross from side to side after the exclusion fencing is installed.

To the southeast of Interstate 15 in California, three paved roads traverse the action area. Morning Star Mine Road runs the length of the valley at the base of the Ivanpah Mountains. Although this road does not constitute an impermeable barrier to desert tortoises, it is heavily used by motorists traveling to Las Vegas at high speeds (NPS 2009). Desert tortoises are routinely killed on this road (NPS 2009). We expect that desert tortoise densities in this portion of the valley are likely depressed adjacent to the road, as discussed by Hoff and Marlow (2002).

Morning Star Mine Road terminates at Ivanpah Road approximately 3 miles south of Nipton Road. Nipton Road bisects the valley, roughly from Interstate 15 in the west, through the town of Nipton, and into Nevada in the east. Ivanpah Road extends from Nipton Road to the south, where it leaves Ivanpah Valley. The effects of these roads on desert tortoises are similar to those we noted for Morning Star Mine Road but likely to a lesser degree because they are less heavily used.

Ivanpah Valley contains numerous unpaved roads, both within the Mojave National Preserve and on Bureau lands, that are used by desert recreationists and by workers who are maintaining various transmission facilities; we expect that most use is for recreation. These unpaved roads are not a barrier to movement, but result in occasional injury to or mortality of desert tortoises (NPS 2009).

Utilities

Three transmission lines, travelling adjacent to and parallel to one another, cross the southern portion of the valley from Cima Dome in the south to where they leave the valley east of the town of Nipton. To the north and east of Primm, approximately nine large (230 kv to 500 kv) transmission lines tie either into the Walter M. Higgins Electrical Substation and switchyard, which is located due east of Primm, or continue to the southwest where they cross the State Line Hills and enter California. Four of these transmission lines pass into California to the north of

ISEGS Unit 1 (and the proposed Units 2 and 3). These lines lie within the Boulder Corridor, which is part of the greater Westwide Energy Corridor which was established as a priority area for future energy transportation facilities. Currently, this utility corridor also supports two gas lines and a fiber optic line; the gas lines were constructed and are maintained by the Kern River Gas Transmission Company (Service 1990, 2002b). The Service recently completed formal consultation on upgrades to an existing electrical transmission line that runs from the south of the Walter M. Higgins Electrical Substation, across Ivanpah Dry Lake, and to near Unit 1 (Service 2011c); this powerline would connect ISEGS to the electrical grid.

The construction of the numerous tower sites for the transmission lines disturbed or destroyed habitat. In general, the amount of habitat completely lost is relatively minor in comparison with the amount of habitat in the valley; a larger amount of habitat remains in a disturbed condition under and around towers. We do not have any quantitative information on the amount of disturbance.

Unpaved roads generally run parallel to the powerlines and provide access to utility company workers and the public; spur roads extend from these roads to each tower. The main and spur roads have resulted in the greatest habitat loss in association; we do not, at this time, have any quantitative information on the amount of habitat loss that these access and spur roads have caused.

The most substantial ongoing effect of the transmission lines is their ongoing use by common ravens for perching and nesting. The presence of this additional nesting substrate, which allows common ravens to nest far above the reach of ground-dwelling predators, likely contributes substantially to the increase in the number of common ravens in the desert. As we discussed in the Status of the Species section of this biological opinion, common ravens prey on desert tortoises; the overabundance of common ravens in the California desert is likely detrimental to the recovery of the desert tortoise. Recently, a pair of nesting common ravens in the Ivanpah Valley was preying on desert tortoises and was removed by a worker from the U.S. Department of Agriculture, Wildlife Services.

The installation of the first Kern River gas line resulted in the disturbance of hundreds of acres of habitat and the deaths of approximately 23 desert tortoises (Service 2002b). (We do not have information regarding how many of these deaths may have occurred in this action area. Additionally, a portion of the mortalities occurred on another pipeline that was addressed in the same consultation.) The second line caused some additional disturbance. The disturbance caused by the pipelines remains evident and, on occasion, repair and inspection work result in new disturbances in the right-of-way.

The use of translocation access roads (both electric and gas) by workers and the public results in the ongoing injury and death of desert tortoises as desert tortoises are struck by vehicles. In one case in the West Mojave near Daggett, a desert tortoise bearing a radio transmitter was buried alive by a utility company maintaining the access road. In the spring of 2011, at least two desert

tortoises have been crushed by vehicles using utility line access roads; based on the use patterns of the utility company at the time, these desert tortoises seem to have been killed by casual users of the access roads.

Rail Lines

A rail line traverses the alluvial fan to the northwest of the New York Mountains, turns north across the valley and passes through the town of Nipton, then turns northwest and north to pass alongside of the Silver State Solar Project in Nevada. From this point, it travels parallel to Interstate 15. This rail line forms a semi-permeable barrier to desert tortoises. Desert tortoises have been known to attempt to cross rail lines and to become entrapped between the rails, where they die of exposure to temperature extremes. The rail line is protected from flood flows by a series of dikes that have been constructed on its uphill side; these dikes have, at least in some cases, created differences in the washes and perennial vegetation above and below the rail line. We cannot, at this time, determine the specific manner in which the rail line and dikes have affected desert tortoises. Because the dikes seem to be concentrating the sheet flow of water that would normally flow across the alluvial fan into defined washes, the potential exists that the decrease in water availability to upland areas has compromised the plant community in upland areas; conversely, the increased flow in the washes may have enhanced habitat suitability for desert tortoises in the washes. The potential also exists that an increased flow of water and debris in washes may increase the number of desert tortoises that are killed or injured during storm events.

The Service and Federal Railroad Administration have completed formal consultation for a proposed high-speed rail line, called Desert Express, which would enter Ivanpah Valley near the southeastern slope of the Clark Mountains, turn north along the upper alluvial fan, turn east to the north of Segment 3 of ISEGS, and then enter Nevada just to the north of Primm. The DesertXpress rail line would occupy a 75-foot-wide permanent right-of-way and require an additional width of approximately 160 feet to construct. This rail line would cross some washes in the action area with bridges; the design plan also includes numerous culverts to allow other washes to pass under the rail line. Because of the bridges and culverts, we anticipate that the proposed rail line would fragment desert tortoise habitat in the valley but not result in an impermeable barrier. The potential exists that the line would affect alluvial fans in the same manner that we have discussed with regard to the Union Pacific Railroad line.

Miscellaneous Facilities

A wastewater pipeline from the Mountain Pass Mine traverses the area to the east of Interstate 15 and terminates on the dry lake bed. This pipeline has been the subject of several consultations (Service 1997a, 1997b, 2006a). Maintenance of the pipeline and clean-up of spills of hazardous materials from the line cause minor amounts of habitat disturbance along its route.

Unit 1 and the CLA of the ISEGS project, which lies roughly to the north of the proposed joint port of entry, occupy approximately 914 acres of formerly suitable habitat for the desert tortoise; this area has been fenced and cleared of vegetation and desert tortoises. We have discussed the original biological opinion for this project previously in this document.

Between Primm and the Lucy Gray Mountains, the construction of the Walter M. Higgins Electrical Substation and switchyard removed all desert tortoise habitat. The area between Primm and substation is highly disturbed.

North of the substation, the Service has issued a biological opinion to the Bureau for the construction and operation of the 2,966-acre Silver State Solar Project. This project, which is located immediately west of the Lucy Gray Mountains and to the north and east of the substation, will result in the removal of all desert tortoise habitat from its footprint. Construction of the first unit of the solar facility is underway (Service 2010h).

To the south of the Primm Valley Golf Course, the California Department of Transportation and Service have completed consultation on the development of a joint port of entry (Service 2006c). This facility would occupy approximately 80 acres along approximately 4 miles of the freeway. Construction of this facility has not begun.

Status of the Desert Tortoise in the Action Area

Previous Consultation's Population Estimates for the Project Site

Based on 2007 and 2008 survey results for the project site, we estimated the number of desert tortoises larger than 180 millimeters in the project area in the 2010 biological opinion; based on this estimate, we calculated the number of individuals smaller than 180 millimeters (Service 2010). In the fall of 2010, BrightSource conducted clearance surveys and construction monitoring in Unit 1 and the CLA and their associated perimeter fences (Woodman 2011a). The following table depicts the numbers we estimated and that BrightSource found.

	Estimates from the 2010 Biological Opinion		**2010 Clearance Surveys and Construction Monitoring**	
	< 180 mm	**> 180 mm**	**< 180 mm**	**> 180 mm**
Unit 1 and CLA	15	14	17	20
Unit 2	7	6		
Unit 3	13	12		
Solar Exclusion Zone	9	8		

Revised Population Estimates for the Project Site (Individuals Larger than 160 millimeters)

Subsequent monitoring of perimeter fence construction around Unit 2 and 3 indicated that the 2010 biological opinion's population estimates were likely inaccurate for these units. In the

spring of 2011, following re-initiation of formal consultation, the Bureau required BrightSource to resurvey Units 2 and 3. Based on these surveys, the Bureau estimated the numbers of desert tortoises larger than 160 millimeters that would likely occur in Units 2 and 3 (Bureau 2011a). However, the 2010 biological opinion identified its subadult and adult population size based on individuals that are larger than 180 millimeters in size. In this biological opinion, we have revised our method for population estimation of larger size classes because the Service's 2010 pre-project survey protocol allows for the inclusion of individuals larger than 160 millimeters in developing a population estimate, thus allowing more of our population estimate to be based on actual measurement of the population. Using the 180 millimeter division in the 2010 biological opinion required estimation of population size for a larger portion of the population based on indirect methods of estimation. Although, use of the 160 millimeter division still requires estimation of population size for smaller size classes (i.e., smaller than 160 millimeters) through indirect methods (i.e., life table method described below) it reduces the degree to which we must use these indirect methods.

Prior to development of the Service's pre-project survey protocol, we believed that desert tortoises less than 180 millimeters would be too difficult to detect. Consequently, results of range-wide monitoring surveys, which are discussed in the Status of the Species and used for estimation of population size for portions of the action area where we do not have pre-project survey information, still report survey results based on the 180-millimeter division. Consequently, this biological opinion provides population estimates based on the 180-millimeter threshold for unsurveyed areas of the action area and population estimates for surveyed portions of the action area based on the 160-millimeter threshold. Because of the numerous assumptions that are involved with estimating population size – whether on a regional or project-specific scale – and the small number of desert tortoises that would fall into the 160- to 180-millimeter range, the difference in the size thresholds used in these two methods of estimating the number of desert tortoises in an area would not affect, in any substantial manner, the analysis contained in this biological opinion. We acknowledge that these different thresholds result in a bias toward more tortoises on the project site as compared to regional densities, but this bias is certainly small in comparison to the statistical error for either the local or regional estimates.

Regardless of the improvement in accuracy gained by use of the 160-millimeter threshold, the estimates have several sources of potential inaccuracy. Because the fences surrounding Unit 2 and 3 do not yet completely enclose these areas, animals with home ranges that overlap the project boundary may have been off-site during the 2011 surveys. Consequently, these animals would not factor into the population estimate, but they may move into the project site prior to clearance surveys. In addition, some individuals accounted for in the estimate may die during the time between the pre-project surveys and the clearance surveys. We cannot predict how many additional animals may move onto the project site or die prior to clearance surveys.

In addition, the method the Bureau used to derive the estimates (i.e., Service's 2010 pre-project survey protocol) does not take into account site-specific or temporal variability in the proportion

of desert tortoises above ground during surveys nor account for the variability in the ability of different surveyors to detect desert tortoises. For example, various environmental conditions could affect the proportion of desert tortoises above ground during the survey period; different environmental conditions require a different correction to calculate the estimate. In addition, variations in habitat type, topography, and other site-specific factors can also affect the detectability factor because surveyors are more likely to detect desert tortoises in flat, open desert, with low shrub density than in areas with deeply incised washes, undulating terrain, and high shrub density. Finally, use of less experienced survey crews may require a different correction factor for detectability because they are less likely to find all of the desert tortoises that are available for detection.

To reduce some of the inaccuracies associated with not knowing the proportion of desert tortoises above ground during the survey period, we looked at data on the number of desert tortoises found above ground on the Ivanpah Valley G_0 plot during a 2-week period before and after the 2011 surveys of Units 2 and 3 (G_0 is the proportion of the population available for sampling; for more detail on this method, please see Service 2009b). These data indicated that, in Ivanpah Valley during that period, approximately 84 percent of the desert tortoises were above ground and available for detection by survey crews. This information allowed us to change this correction factor (i.e., P_a) from the average value of 0.8 used in the Service's 2010 survey protocol (Service 2010) to a more site and time-specific correction factor of 0.84.

The table below summarizes the population estimates for desert tortoises larger than 160 millimeters on Unit 2 and 3 along with the known number of individuals in this size class that BrightSource cleared from Unit 1 and the CLA. It provides the population information from the Bureau's biological assessment and the population estimates derived from use of the site and time-specific Pa value (i.e., availability correction factor of 0.84 derived from the G_0 data). Given the sources of potential inaccuracy in the population estimates, we have described the number of desert tortoises on the project site that are larger than 160 millimeters as a range rather than a point estimate. We will use the estimates derived through use of the site and time-specific Pa value (i.e., derived using a Pa of 0.84) in the remainder of the biological opinion.

	Estimates based on Spring 2011 Surveys and 2010 Clearance Surveys and Construction Monitoring	
	$P_a = 0.8$	$P_a = 0.84$
Unit 1 and CLA		
Number Cleared	20	20
Unit 2		
Point Estimate	16	15.2
95 Percent Confidence Interval	6.47 - 39.62	6.71 - 34.62
Unit 3		
Point Estimate	49.5	47.1
95 Percent Confidence Interval	24 - 101.9	25.8 and 85.96
Project Site Total		

Point Estimate†	86	84
Range based on 95 Percent Confidence Interval†	50 - 162	51 - 141

† Values for each Unit are rounded to a whole number prior to summation. For point estimates and for the upper limit of the 95 percent confidence limit, the value was rounded up to the nearest whole number. For the lower limit of the 95 percent confidence interval, the number was rounded down to the nearest whole number.

Revised Population Estimates for the Project Site (Eggs and Individuals Smaller than 160 millimeters)

Our current pre-project survey protocol does not provide a method for estimating the number of desert tortoises smaller than 160 millimeters. In the 2010 biological opinion, we used an observed proportion of the population composed of different size classes at the Goffs study site (Turner et al. 1987) to derive an estimate of the number of smaller animals in the action area. The Bureau did not propose to use the method from the 2010 biological opinion for estimation of smaller size classes.

In the biological assessment for this consultation (Bureau 2011a), the Bureau proposed several potential methods for deriving an estimate from the available information. Because two of these methods (i.e., Method 1 and Method 2) provide estimates based on the number of individuals smaller than 160 millimeters that BrightSource found during clearance surveys, we have chosen not to base our analysis on these two methods. We have done so because clearance surveys and construction monitoring likely found only a small fraction of the individuals in these smaller size classes. Consequently, these methods are likely to underestimate the actual number of individuals on the project site.

In the biological assessment, the Bureau developed a hypothetical 15-year life table to derive its estimate (Bureau 2011a). Specifically, the Bureau uses a life table and estimates of annual egg production to derive a population estimate for smaller size classes. In this biological opinion, we have not used the life table provided by the Bureau because it is hypothetical and not based on population studies.

Instead, we have used a life table developed through study of the Goffs Study Plot (Turner et al. 1987). As stated in Turner et al. (1987), the life table has limited predictive ability because it assumes invariant schedules of reproduction and death and constant annual rates of increase or decrease in size. In addition, our use of the life table assumes that current egg production and survival rates on the ISEGS project site are similar to that on the Goffs study site in the early 1980s. However, differences in resource availability, threats, and a variety of other variables can result in differences in the overall mortality rate of individuals at different sites and times and thereby create differences in the proportion of the population composed of individuals in these smaller classes. In addition, this study relied on a survey that does not account for the dynamic changes in the number of juveniles that are present over the course of a year. Therefore, depending on the time of year that clearance surveys occur, the number of desert tortoises could vary considerably. For example, many more desert tortoises will be present

immediately following the hatching of multiple egg clutches in late summer or early fall than in the early spring when many juveniles from the previous season's cohort would likely have died.

We cannot determine the actual number of desert tortoises smaller than 160 millimeters with any accuracy. Even for larger size classes, where direct measurement of the population offers an opportunity to provide better estimates, the patchy distribution of desert tortoises on the landscape, the cryptic nature of the species, and variations in availability and detectability of individuals provide numerous sources of error and extremely wide confidence intervals. This problem is exacerbated when we use these estimates to derive population estimates for smaller size classes from a life table that has its own inherent flaws and assumptions. However, in the absence of a method for direct census of all size classes of individuals, the Goffs life table provides the best available information and thus a reasonable method of characterizing of the population. The desert tortoise population on the Goffs study site may have been more robust in the early 1980s than that currently on the ISEGS project site, because of the declines that have occurred since that time; consequently, use of the Goffs data may overestimate the actual number of smaller desert tortoises within the project area. The magnitude of this overestimate is unknown.

Using the annual survival rates from the Goffs life table, the formula for estimating annual egg production in the Bureau's biological assessment (Bureau 2011a), and a 1:1 sex ratio, we estimated the number of individuals smaller than 160 millimeters in all portions of the action area (Croft 2011c). In the summary below, we have grouped the egg and hatchling stage into a single estimate because we cannot predict the precise time of year when eggs from various clutches would hatch, so we cannot predict whether project activities would affect the egg or the hatchling stage at any given point in time. Because BrightSource performed the surveys of Unit 1 and the CLA in fall, most viable eggs had likely hatched by the time of clearance surveys and most unhatched eggs had been lost due to various sources of egg mortality. Turner et al. (1987) used an egg-hatching rate of 55 percent in the life table that we have used to estimate the number of individuals in smaller size classes. We have applied that rate to the yearly egg/hatchling production predicted in Croft (2011c) (i.e., approximately 61) for Unit 1 and the CLA to estimate how many hatchlings were available for detection during clearance surveys.

	Hatchlings/Eggs	**49.7 mm to 120 mm**	**120 mm to 160 mm**	**>160 mm**
Unit 1 and CLA	~34	~112	~9	20
Unit 2 and 3	99 to 373 (196)	181 to 684 (359)	15 to 56 (30)	31 to 121 (64)
Project Site Total	160 to 434 (257)	293 to 795 (471)	24 to 65 (39)	51 to 141 (84)

Numbers in parentheses indicate the population point estimate for individuals greater than 160 millimeters or an estimate derived from that point estimate using the life table estimation for individuals smaller than 160 millimeters.

Population Estimates for the Proposed Recipient sites

In the 2010 biological opinion, the translocation strategy divided the recipient sites into short-distance and long-distance recipient sites and our action area incorporated all areas to which desert tortoises might move following release (Service 2010d). Because no survey information was available to cover all portions of this area, the 2010 biological opinion extrapolated the estimated population density for the ISEGS project site to these sites to derive a population estimate. Because of the revisions to the recipient sites in this biological opinion and the availability of new survey information for the proposed recipient site, we have revised our previous population estimates.

In the spring of 2011, following re-initiation of formal consultation, BrightSource performed surveys of the recipient sites for the revised translocation strategy using the Service's pre-project survey protocol for desert tortoises (Service 2010). The table below summarizes the estimates for individuals larger than 160 millimeters (Woodman 2011b):

	Size (acres)	Individuals Located During Survey	Point Estimate (>160 mm)	Population Estimate Range	Density Range (Point Estimate) [individuals per square mile]
Unit 1 Recipient Site	3,222	22	44	21 to 94	4.0 to 18.6 (8.7)
Unit 2 Recipient Site	2,342	13	26	12 to 59	3.1 to 15.9 (7.1)
Unit 3 Recipient Site	3,911	43	86	43 to 170	7 to 27.7 (14.1)
Interstate 15 Recipient Site	1,273	16	32	15 to 68	9.9 to 40.6 (20.2)
Total Recipient Site	10,748	94	188	91 to 391	6 to 24 (11.2)

Values in parentheses represent the density estimate based on the population point estimate.

Based on application of the life table method for estimation of smaller size classes, we estimated the number of individuals smaller than 160 millimeters that could potentially occur within the recipient sites (Croft 2011c). The following table provides the results of the application of this estimation method for all size classes:

	Hatchlings/Eggs	49.7 mm to 160 mm	>160 mm	Total Individuals
Unit 1 Recipient Site	68 to 286 (135)	134 to 569 (267)	21 to 94 (44)	223 to 949 (446)
Unit 2 Recipient Site	38 to 183 (80)	74 to 363 (158)	12 to 59 (26)	124 to 605 (264)

Unit 3 Recipient Site	135 to 520 (263)	267 to 1031 (521)	43 to 170 (86)	445 to 1721 (870)
Interstate 15 Recipient Site	50 to 208 (99)	99 to 413 (196)	15 to 68 (32)	164 to 689 (327)
Recipient Area Total	291 to 1197 (577)	574 to 2376 (1142)	91 to 391 (188)	956 to 3964 (1907)

Values in parentheses represent the density estimate based on the population point estimate.

As stated in previous portions of this section, only the estimates for the number of individuals larger than 160 millimeters are based on direct measurement of the population. The remaining estimations, which we derived from the life table, are subject to numerous sources of potential error associated with the application of this method, and the values derived from this method may overestimate of the true population size, but we have determined that it represents a reasonable approach for deriving these estimates based on the best available information.

Population Estimates for the Remaining Portions of the Action Area

Because the Service has estimated the density of desert tortoises within the Ivanpah Critical Habitat Unit through line-distance sampling, we have applied this information to all other portions of the action area for which we do not have pre-project survey information. These additional areas include the control area and all portions of Ivanpah Valley that population fragmentation may indirectly affect. Based on the size of these areas (317 square miles, Croft 2011a) and an average of the yearly density between 2007 and 2010 for the Ivanpah Critical Habitat Unit (i.e., 12.2 adult desert tortoises per square mile), we estimate that these areas contain approximately 3,867 adult desert tortoises. All previous discussions regarding caveats for population estimates apply to these estimates. In addition, the sources of error are further compounded by the assumption that the desert tortoise density estimated for the entire Ivanpah Critical Habitat Unit would also apply to the subset of that critical habitat unit that overlaps the action area for this project.

Summary

Maintaining "self-sustaining populations of desert tortoises within each recovery unit into the future" is a primary objective for recovery of the Mojave desert tortoise (Service 1994 and Service 2008c). Absent the conservation of each recovery unit, we cannot conserve all of the genetic and morphological variations and differences in behavior and ecology that comprise the species. The Ivanpah Valley is an important component of the Northeastern Mojave Recovery Unit because it continues to support a relatively large number of desert tortoises across a range of habitat types. However, the existing developments within the Ivanpah Valley have likely affected population trends within the valley and affected the connectivity of populations within the action area to other desert tortoise populations in other portions of the recovery unit.

In an undisturbed state, desert tortoises in this valley would likely maintain long-term population stability and connections to desert tortoises to the north. However, even without human disturbance, the linkage from the Ivanpah Valley to the remainder of the desert tortoise's range is confined by mountain ranges and the northern end of Ivanpah Dry Lake. On the southern end of the valley, desert tortoises may maintain some connectivity across Cima Dome. Data collected during range-wide sampling from 2007 through 2010 seem to show lower relative abundance of desert tortoises in this area, thereby indicating that this connection may be tenuous (Service 2009b, 2010f, 2010g).

Under the existing conditions, numerous developments have resulted in the loss of a substantial amount of habitat in Ivanpah Valley; these features include, but are not limited to, the first units of ISEGS and the Silver State Solar project, the Primm Valley Golf Course, the communities of Nipton and Primm, Interstate 15, three paved and numerous unpaved roads, an electrical substation and switchyard, and the Union Pacific Railroad line. Other developments have undergone consultation and are likely to contribute to additional habitat loss in the future; these projects include the DesertXpress rail line, the remaining phases of the Silver State project, and the joint port of entry. The rail lines and freeway form semi-permeable barriers to the movement of desert tortoises through the valley. The roads (both paved and unpaved) contribute to ongoing mortality of desert tortoises. Transmission lines attract common ravens in the region. Historic (and, on a smaller scale, continued) grazing by cattle and burros have decreased the overall value of habitat in the basin.

Although we cannot quantify the overall effect on the viability of the population of desert tortoises in the valley, these developments and their associated activities decrease the long-term stability of desert tortoises in the Ivanpah Valley. Because of natural topographical constraints, the movement of desert tortoises into Ivanpah Valley to augment a decline in numbers would likely occur at a very slow rate. Given the additional constraints posed by Primm, Interstate 15, the Union Pacific RailRoad (and future DesertXpress) line, the electrical substation, and Silver State project, the rate of movement of desert tortoises into and out of Ivanpah Valley has likely been reduced even further.

EFFECTS OF THE ACTION

The estimates of the number of desert tortoises and eggs derived from the clearance surveys of Unit 1 and the CLA, the 2011 pre-project survey of Units 2 and 3, and the Service's range-wide monitoring program constitute the best available information regarding the number of desert tortoises in the action area. For this reason, we have used the estimates from the Environmental Baseline section of this biological opinion, in the following analysis. Because we report these as a range of potential values, our analysis also provides ranges when addressing the magnitude of effects.

We have organized this section into four primary subsections: 1) effects associated with movement of desert tortoise through translocation, 2) effects associated with mortality during

project construction, 3) effects associated with operation and maintenance of the facility, and 4) effects associated with habitat loss and population fragmentation.

Summary of Effects Associated with Clearance and Quarantine Activities under the Previous Consultation

Activities associated with the translocation effort have resulted in the handling (i.e., clearance surveys, transmitter placement, health assessments, and blood collection) of 152 desert tortoises (35 in the control site, 36 from Unit 1 and the CLA, and 81 from the recipient population or unfenced portions of Unit 2 and 3). BrightSource has placed transmitters on 131 of these desert tortoises, conducted visual health assessments on 30, and collected blood from 28 to facilitate disease testing (Woodman 2011a). No mortality of individuals occurred due to inappropriate handling of individuals. We anticipate that few if any individuals currently carrying transmitters would die because of improper handling. We have reached this conclusion because experienced biologists, authorized by the Service, performed these activities in accordance with approved handling procedures.

Of the 36 desert tortoises initially located on Unit 1 and the CLA, BrightSource placed 27 (i.e., 13 larger than 160 millimeters, 4 between 120 and 160 millimeters, 6 between 49.7 and 120 millimeters, and 4 hatchlings) in the onsite quarantine facility. The remaining 9 individuals (i.e., 7 larger than 160 millimeters and 2 between 49.7 and 120 millimeters) either moved outside of the project site prior to the completion of the perimeter fence or were placed outside of the project site after they demonstrated a substantial amount of fence-pacing behavior. BrightSource attached transmitters to these animals and continues to monitor them. No mortality has occurred in this group of individuals.

BrightSource has placed 36 desert tortoises (i.e., 16 larger than 160 millimeters, 4 between 120 and 160 millimeters, 10 between 49.7 and 120 millimeters, and 6 smaller than 49.7 millimeters) into quarantine pens from all portions of the project site to await translocation (Woodman 2011a). Most of these individuals were from Unit 1 and the CLA, but a small number of individuals were from Units 2 and 3. No mortality of these individuals has occurred in association with activities at the quarantine facility and we do not anticipate that any would occur in the future because BrightSource is managing the facility in accordance with an approved animal husbandry plan and desert tortoises readily adapt to captivity. In the fall of 2011, BrightSource will translocate all individuals located within the quarantine facility in accordance with the revised translocation strategy identified in this biological opinion.

Effects of the Revised Translocation Strategy

Effects of Clearance and Quarantine of Individuals 120 millimeters or Larger

Based on the size class information in Woodman (2011a), we anticipate that BrightSource would translocate 20 individuals larger than 120 millimeters from the onsite quarantine facility

in the fall of 2011. In addition, we anticipate that BrightSource would clear between 31 and 121 desert tortoises larger than 160 millimeters (point estimate of 64) from Units 2 and 3 in summer or fall of 2011. These individuals would be released in the recipient sites in the fall of 2011.

Although we anticipate that BrightSource would clear and translocate some additional individuals between 120 and 160 millimeters from Units 2 and 3, they are unlikely to find all individuals because of the difficulty in locating smaller size classes. In the Environmental Baseline, we estimated that Unit 1 and the CLA could have contained approximately 9 individuals between 120 and 160 millimeters. During clearance surveys of Unit 1 and the CLA, BrightSource located four individuals in this size range (i.e., approximately 44 percent of our estimate) (Woodman 2011a). Assuming that surveyors would find a similar percentage on Units 2 and 3, BrightSource could find between 7 and 25 desert tortoises between 120 and 160 millimeters (point estimate of 14).

Based on the information provided above, we estimate that BrightSource could release between 58 and 166 desert tortoises (point estimate of 98) into the recipient sites that are either currently in the quarantine facility or in Units 2 and 3 in the fall of 2011. We cannot predict how many of these individuals BrightSource would translocate to the within-home-range versus outside-home-range recipient sites because we cannot predict what portion of the project site that individuals would occupy when clearance surveys occur. Because of the need to await disease-testing results and the need to allow females to lay eggs within the quarantine facility, BrightSource may hold these individuals for several months prior to release. Because BrightSource would hold these individuals for a short period in a facility approved by the Service, we anticipate little if any injury or mortality of individuals held in short-term quarantine, but their normal behavioral patterns are likely to be affected. In addition, capturing and handling of desert tortoises during clearance, quarantine, or translocation for blood collection, health assessments, transmitter placement, or a variety of other reasons is likely to result in little if any injury or mortality because BrightSource will use experienced biologists authorized by the Service to perform these tasks. However, because the Bureau will allow clearance of individuals from some limited portions of the project site during the summer of 2011, we anticipate that individuals cleared from these areas will experience a higher potential for injury and/or mortality, and a higher degree of effects to their normal behavioral patterns. The Bureau has proposed numerous measures to reduce the potential effect of summer clearance activities, which should reduce the potential for mortality. In addition, the limited area that the Bureau would approve for clearance is likely to minimize the number of individuals affected. Consequently, we anticipate that summer clearance activities would result in the injury or mortality of few individuals.

Effects of Clearance and Quarantine of Individuals 120 millimeters or Smaller

Currently, BrightSource is maintaining 16 individuals smaller than 120 millimeters within the onsite quarantine facility (Woodman 2011a). In addition, BrightSource has quarantined 7

females of reproductive age that could produce up to 42 eggs if we apply the formula in the Bureau's biological assessment for egg production (Bureau 2011a). Using an 80 percent egg-hatching rate from Nagy (2010) to reflect higher egg hatching potential within the quarantine facility, we estimate that these eggs could produce up to 34 hatchlings that BrightSource would also maintain for a period of up to 5 years.

We have estimated that between 99 and 373 hatchlings or eggs (point estimate of 196) and between 181 and 684 desert tortoises smaller than 120 millimeters (point estimate of 359) could occur on Units 2 and 3. BrightSource is unlikely to locate a large portion of the smaller desert tortoises or any eggs, given the time of year for clearance surveys and the difficulty in finding eggs. Consequently, we do not anticipate that BrightSource will place any eggs in the quarantine facility from Units 2 or 3. To determine a worst-case scenario for the number of hatchlings present for a clearance survey on Units 2 and 3, we will assume that clearance surveys would occur after all eggs have hatched for a given year and a 55 percent egg-hatching rate, per the life table in the Environmental Baseline section. Therefore, we estimate that Units 2 and 3 could have between 55 and 206 hatchlings (point estimate of 108) under the worst-case scenario. Adding to this the number of individuals between hatchling size and 120 millimeters, we estimate between 236 and 890 desert tortoises smaller than 120 millimeters (point estimate of 467) could be present during the clearance of Units 2 and 3.

In the Environmental Baseline, we estimated that Unit 1 and the CLA could have contained up to 146 desert tortoises smaller than 120 millimeters prior to clearance. During clearance surveys, BrightSource located 12 individuals within this size class (i.e., 8.2 percent). Applying this proportion to the estimate above, we anticipate that BrightSource could clear and quarantine between 20 and 73 desert tortoises smaller than 120 millimeters (point estimate of 39). Based on the cumulative total of these estimates, BrightSource may need to quarantine between 70 and 123 desert tortoises (point estimate of 89) for up to 5 years. Handling of desert tortoises during clearance, quarantine, or translocation for blood collection, health assessments, transmitter placement, or a variety of other reasons is likely to result in little if any injury or mortality because BrightSource will use experienced biologists authorized by the Service to perform these tasks. However, given the length of time that some individuals would remain in the onsite quarantine facility some individuals are likely to die from natural causes or unforeseen circumstances.

Based on 5 years of data on desert tortoise survivorship at the Marine Corp Air Ground Combat Center's head-start facility, Nagy (2010) reported that up to 80 percent of hatchlings survived their first year of life and yearly survival for individuals larger than hatchlings was up to 90 percent. While this is not 100 percent yearly survival, this mortality rate is substantially less than what individuals in these size classes would experience in the wild. We cannot predict how long a group of animals will stay within the quarantine facility because we do not know what the size class distribution will be for animals removed from the project site or how long it would take to reach cohorts of 30 individuals of 120 millimeters. However, because we know that BrightSource would not hold animals for more than 5 years, we will apply a 10 percent

yearly mortality rate (i.e., 90 percent yearly survivorship) for individuals within the quarantine facility. Based on this mortality rate, we estimate that between 25 and 43 desert tortoises (point estimate of 31) would likely die in BrightSource's facility over the course of the quarantine period, which is substantially less than we would predict if these individuals were released directly into the translocation area. Based on the estimated mortality during long-term quarantine and our previous clearance survey estimates, we anticipate that BrightSource will translocate between 45 and 80 desert tortoises (point estimate of 58) to the Interstate 15 recipient site over the course of this 5-year period.

Effects of Post-Translocation Monitoring

Based on the post-translocation monitoring program described by the Bureau and the number of individuals that would likely be translocated, we anticipate that BrightSource could monitor a combined population of between 309 and 738 desert tortoises (point estimate of 468) in the translocated, recipient, and control populations for a period of up to 10 years (i.e., 5 years post-translocation monitoring for initial translocation and 5 years post-translocation monitoring for the delayed release of individuals smaller than 120 millimeters). BrightSource will capture, handle, attach transmitters, and periodically perform health assessments of all these individuals over the monitoring period. As part of the post-translocation monitoring program, BrightSource will also collect blood from the translocated, recipient, and control populations to determine the overall disease prevalence within these populations. Based on the frequency of monitoring described in the Bureau's translocation strategy and the need to periodically change transmitters, BrightSource is likely to capture and handle each animal numerous times over the course of the monitoring period. Some potential exists that handling of desert tortoises may cause elevated levels of stress that may render these animals more susceptible to disease or dehydration from loss of fluids. Because BrightSource will use experienced biologists approved by the Service, and approved handling techniques, these desert tortoises are unlikely to suffer substantially elevated stress levels resulting from handling and monitoring activities.

Post-Translocation Effects

As stated above, we anticipate that BrightSource could release between 103 and 246 desert tortoises (point estimate of 156) into the recipient sites over the course of the next 5 years. However, because of the methods used to estimate population size for individuals smaller than 160 millimeters, this is likely an overestimate, but the magnitude of the overestimate is unknown. The Bureau has established a post-translocation density threshold of 21 desert tortoises per square mile for the recipient site. This threshold is 130 percent of the 2007-point estimate of the adult (i.e., individuals larger than 180 millimeters) population density of the Ivanpah Critical Habitat Unit. Generally, line-distance sampling occurs within the boundaries of desert wildlife management areas, which support the majority of critical habitat. The National Park Service does not have desert wildlife management areas on land it manages, but does have critical habitat in the Mojave National Preserve. Because we sample both National Park Service and Bureau lands, we will refer to the sampling area here as the critical habitat

unit. Because the ISEGS project site is in the same valley as a portion of this critical habitat unit and in close proximity to the remaining portions of the critical habitat unit, post-translocation density of 130 percent of this density estimate would likely not represent a substantial increase in overall population density in the recipient sites. In addition, if the threshold incorporated individuals in the Ivanpah Critical Habitat Unit that were between 160 millimeters and 180 millimeters, the density threshold would likely be larger. Consequently, compliance with the threshold proposed by the Bureau will provide a conservative limit on post-translocation density.

Because the density estimate for the Ivanpah Critical Habitat Unit is a point estimate for the adult population of the sampled area, we have used the point estimate densities for individuals larger than 160 millimeters for the project site and recipient sites to determine compliance with this threshold. Based on the point estimate for the number of desert tortoises that BrightSource will likely translocate over the next 5 years (i.e., 156 individuals larger than 120 millimeters), and the combined size of the recipient site (16.8 square miles), we anticipate that post-translocation density is not likely to exceed the density threshold established by the Bureau. Vegetation surveys of the recipient sites and project sites indicate that vegetation and forage resources are similar to the recipient sites than they are on the project site except for the southern end of the Interstate 15 recipient site.

Because BrightSource would enclose the Interstate 15 recipient site in exclusion fencing, we have also analyzed the ability for this individual recipient site to meet the density threshold. Based on our current population point estimate for the resident population in the Interstate 15 recipient site (i.e., 32 individuals larger than 160 millimeters) and the size of this recipient site (i.e., 2 square miles), we anticipate that it can accommodate additional desert tortoises without violating the Bureau's density threshold. We cannot predict whether this translocation area will be large enough to accommodate all outside-home-range translocated desert tortoises because we do not know what proportion of the project site animals will require this type of translocation.

Following release, we cannot predict the movement patterns that all translocated animals are likely to exhibit. Translocation studies, including a study performed in the Ivanpah Valley, have shown that straight-line movement distances following release can be over 3.73 miles in the first year for some desert tortoises (Berry 1986, Field et al. 2007, Nussear 2004). Mean dispersal distances observed on 3 study plots south of Fort Irwin ranged from 0.09 to 3.5 miles, with maximum dispersal distances of between 7.8 to 14.3 miles (Walde et al. 2008). For short distance translocations, data appear to indicate shorter post-translocation dispersal distances (0.5 to 0.9 miles) (Walde et al. 2008). Translocated populations can also significantly expand the area they occupy in the first year following translocation (e.g., from 3.9 to 6.9 square miles at a Nevada site; from 0.2 to 10.3 square miles at a Utah site). The degree to which these animals expand the area they use depends on whether the translocated animals are released into typical or atypical habitat; that is, if the recipient site supports habitat that is similar to that of the source area, desert tortoises are likely to move less (Nussear 2004).

Some translocation studies have found that translocated animals seem to reduce movement distances following their first post-translocation hibernation to a level that is not significantly different from resident populations (Field et al. 2007, Nussear 2004). As time increases from the date of translocation, most desert tortoises change their movement patterns from dispersed, random patterns to more constrained patterns, which indicate an adoption of a new home range (Nussear 2004). However, translocation studies at Fort Irwin have found that desert tortoises that were released a substantial distance from their capture site moved greater distances than both resident and control groups over a 3-year period, but animals released a short distance from their capture site had similar movement patterns to those of resident and control groups (Averill-Murray 2011). This may indicate that some translocations may result in translocated animals that take longer to settle into new home ranges after release, but this is likely influenced by the distance that the animals are moved from their capture site.

We cannot predict the direction that translocated animals are likely to move. In some studies, translocated desert tortoises have exhibited a tendency to orient toward the location of their capture and attempt to move in that direction (Berry 1986), but in other instances, no discernible homing tendency has been observed in translocated animals (Field et al. 2007). Information specific to short-distance translocations indicates that at least some individuals will attempt to return to their former home ranges after release (Stitt et al. 2003, Rakestraw 1997).

Based on this information, desert tortoises moved adjacent to the project site under the within-home-range translocations are likely to move distances similar to that observed by Walde et al. (2008) because they will be translocated a relatively short distance. Some of the translocated desert tortoises are likely to attempt to return to the project site, where they would encounter the project site fence and either turn around or walk the fence line. Walking the fence line can result in the death of desert tortoises, if they become overheated while persisting in their efforts to find an opening in the fence; one desert tortoise died in this manner in 2011 on the ISEGS project site (Woodman 2011d).

Following the first hibernation period after translocation, individuals moved to the within-home range recipient site are likely to significantly reduce movement distances and establish new home ranges. For individuals moved to the Interstate 15 recipient site under the outside-home-range translocations, attempts to make long-distance movements are likely to be greater than that predicted for the within-home-range translocations, and these animals are likely to take a significant amount of time to settle into new home ranges. Perimeter fencing around this recipient site will restrict this movement, but individuals in this recipient site are likely to exhibit some degree of fence pacing behavior. BrightSource will monitor fences desert tortoises exhibiting fence-pacing behavior. If desert tortoises are found exhibiting this behavior, they will be tracked to ensure that they do not perish along fence lines.

During the period prior to home range establishment, desert tortoises that BrightSource translocates off the project site may experience a higher potential for mortality because they are

moving larger distances through less familiar territory and are less likely to have established cover sites for protection. Studies have documented various sources of mortality for translocated individuals, including predation, exposure, fire, disease, crushing by cattle, and flooding (Nussear 2004, Field et al. 2007, Berry 1986, U.S. Army 2009, 2010). Because of the post-translocation movements exhibited by desert tortoises, some potential also exists for desert tortoises to die on roads during the period when translocated individuals are seeking new home range locations. Based on the location of the proposed recipient sites, the potential exists for all seven sources of mortality within the action area. However, fire is likely to be localized and highly dependent on the abundance of non-native grasses and other weeds. In addition, the potential for loss of individuals due to post-translocation road kills would be reduced because BrightSource will fence Interstate 15, Colosseum Road, and Yates Well Road, which are the only regularly used roads that translocated desert tortoises would come in contact with following release. However, some potential still exists for loss of a few individuals due to road kills on dirt routes that cross the translocation area.

As with other translocations (Nussear 2004, Field et al. 2007, U.S. Army 2009, 2010), we anticipate that predation is likely to be the primary source of post-translocation mortality. The level of winter rainfall may dictate the predation observed in desert tortoises (both translocated, resident, and control) (Drake et al. 2010). Study of translocated desert tortoises at Fort Irwin has documented a statistically significant relationship between decreased precipitation and increased predation (Drake et al. 2010). Because BrightSource would not translocate desert tortoises during drought years, post-translocation predation is unlikely to reach levels documented at Fort Irwin.

Translocating desert tortoises may also adversely affect resident desert tortoises within the action area due to local increases in population density. Increased densities may result in an increased spread of upper respiratory tract disease or other diseases, an increased incidence of aggressive interactions between individuals, and an increased incidence of predation that may not have occurred in the absence of translocation. Saethre et al. (2003) evaluated the effects of density on desert tortoises in nine semi-natural enclosures at the Desert Tortoise Conservation Center in Nevada. The enclosures housed from approximately 289 to 2,890 desert tortoises per square mile. Saethre et al. (2003) observed a greater incidence of fighting during the first year of the experiment but did not detect any trends in body condition index, reproduction, or presence of the symptoms of upper respiratory tract disease among the enclosures. Body condition index and reproduction are important indicators of how translocation may affect resident desert tortoises; generally, stress suppresses body condition index and reproduction in desert tortoises. This study did not draw any conclusions regarding density-dependent effects on predation of desert tortoises.

We anticipate that density-dependent effects on resident populations are likely to be minor for the following reasons. First, current densities in the recipient sites are likely to be low based on our population estimates for the action area. Second, desert tortoises will be released in a dispersed pattern. Third, the within-home-range recipient site is not a confined space, so released individuals would be able to disperse into other areas. Finally, the Bureau's post-

translocation density threshold is significantly lower than densities used by Saethre et al. (2003), who did not detect any effects of the increased density.

Translocation has the potential to increase the prevalence of diseases, such as upper respiratory tract disease, in a resident population. Stress associated with handling and movement or due to density dependent effects could exacerbate this threat if translocated individuals with subclinical upper respiratory tract disease or other diseases begin to exhibit clinical signs of disease due to the stress associated with handling and movement. However, recent information from the Fort Irwin translocation project indicates that translocations in that study did not cause a measurable physiological stress response (Averill-Murray 2011).

We cannot reasonably predict the increase in disease prevalence within the resident population that may occur due to translocation. However, several mitigating circumstances are likely to reduce the magnitude of this threat. First, for example, BrightSource will use experienced biologists and approved handling techniques that are unlikely to result in substantially elevated stress levels in translocated animals. Second, desert tortoises on the project site are currently part of a continuous population with the resident populations of the recipient sites and are likely to share similar pathogens and immunities. Third, BrightSource will move many of the translocated desert tortoises a relatively short distance into the within-home-range recipient site, which is likely to reduce post-translocation stress associated with long-distance movements. Fourth, density dependent stress is unlikely to occur for the reasons discussed in the previous paragraph. Finally, BrightSource will not translocate any animal that has clinical signs of disease.

In a study conducted in Ivanpah Valley, 21.4 percent of 28 translocated desert tortoises died (Field et al. 2007). Other studies have documented mortality rates of 0, 15, and 21 percent in other areas (Nussear 2004, Cook et al. 1978 in Nussear 2004). Esque et al. (2010) observed mortality of 89 of 357 translocated desert tortoises (24.9 percent). Esque et al. (2010) and Nussear (2004) found that mortality among translocated animals was not statistically different from mortality observed in resident populations. In addition, Esque et al. (2010) found that mortality rates in resident (29 of 140 desert tortoises; 20.7 percent mortality), control (28 of 149 desert tortoises; 18.8 percent mortality), and translocated (89 of 357 desert tortoises; 24.9 percent) populations did not differ statistically and concluded that the translocation was not the cause of the observed mortality. With the exception of the Esque et al. (2010) study, none of the studies cited in this paragraph used controls to compare mortality rates in resident and translocated populations to the mortality rate experienced in populations not affected by translocation.

Based on this information, we anticipate that post-translocation mortality will be approximately equal among the resident, control, and translocated population. We cannot precisely predict the level of post-translocation mortality in these groups because regional factors that we cannot control or predict (e.g., drought, predation related to a decreased prey base during drought, etc.) would likely exert the strongest influence on the rate of mortality. Because we cannot, with any

certainty, predict the weather over the next 20 years, refined estimates of post-translocation mortality are not possible. If mortality rates were similar to that seen in the studies of previous translocations, we could expect post-translocation mortality of between 26 and 62 translocated desert tortoises (point estimate of 39); however, we have no information to suggest that we will experience similar levels of mortality during the translocation from the ISEGS facility. Because past studies have documented similar levels of mortality between translocated, recipient, and control site populations, we also estimate that a similar proportion of the control and recipient site populations would die. We do not anticipate this mortality will be the direct result of translocation because predation rates in the Ivanpah Valley are likely to be the primary driver of the mortality in the region, although individuals will also likely die from other causes. The monitoring of the control population will assist us in determining whether this prediction is realized.

Effects of Clearance of Individuals on Linear Facilities

BrightSource will move desert tortoise a short distance out of harm's way along linear facilities associated with this project (i.e., fiber-optic line, gas line, recipient site fencing). We cannot estimate the precise number of individuals that BrightSource would capture and handle during these activities. Capturing and handling of desert tortoises during these clearances is likely to result in little if any injury or mortality because BrightSource will use experienced biologists authorized by the Service to perform these tasks. However, any desert tortoise moved from linear facilities will likely continue to occupy familiar territory and use known shelter sites and is unlikely to suffer post-translocation mortality associated with displacement from the work area. However, construction of some linear facilities that create barriers to movement may result in additional effects. We have discussed these effects later in the analysis.

Summary of Effects Associated with Construction of the ISEGS Facility under the Previous Consultation

In the fall of 2010 and the spring of 2011, BrightSource installed perimeter fencing, including desert tortoise exclusion fencing around Unit 1 and portions of Units 2 and 3 and began construction of Unit 1 and the power block of Unit 2. During implementation of these actions, one juvenile desert tortoise died when it was crushed by a vehicle along the fence line of Unit 3 and one desert tortoise died when it overheated while pacing a project site fence line (Woodman 2011d, LaPre 2011a, LaPre 2011b). The Bureau attributed both mortalities to construction activities.

In addition to these documented mortalities, numerous individuals smaller than 160 millimeters, likely died within Unit 1 and the CLA during construction because clearance surveys probably did not locate all individuals within these areas. In the Environmental Baseline section, we estimated that Unit 1 and the CLA could have contained 155 desert tortoises smaller than 160 millimeters. Of these, BrightSource located 16 (10.3 percent) during clearance surveys and construction monitoring of Unit 1 and the CLA. Based on these population estimates and the

clearance surveys results, as many as 139 desert tortoises smaller than 160 millimeters in size may have died during construction in 2010 and 2011. As discussed previously, this number is likely an overestimate, given the numerous sources of error associated with our estimation of population size for smaller size classes. In addition, because detectability of individuals declines for smaller size classes (i.e., we predicted that BrightSource would find 44 percent of the individuals between 120 and 160 millimeters but a far smaller proportion for hatchlings and individuals from hatchling size to 120 millimeters), most of the individuals that would comprise the predicted mortality would be comprised of individuals that are far from being recruited into the population. Because there is so much mortality in juveniles, the stage that is most informative as to the effects on a given population is the recruitment rate (i.e., number of individuals reaching reproductive age per year) and the mortality rate of adult individuals. For tortoises, it is estimated that only 2 to 5 percent of hatchlings are recruited into the population (Service 1994). The rest die prior to reaching reproductive age, where they would be able to contribute to population stability. Consequently, of the predicted mortality above, it is likely that only a small portion of it (i.e., that comprised of individuals close to recruitment age) could have any measurable effect on population trends. The remaining juvenile mortality is unlikely to result in any measureable effect in population trend over the long term.

Effects Associated with Construction of the Remaining Portions of the ISEGS Facility

BrightSource will install desert tortoise exclusion fencing and security fencing around the remaining portions of Units 2 and 3 and clear all desert tortoises that it can locate on the project site prior to ground disturbance. During construction of the permanent perimeter fencing and during other ground-disturbing activities that are outside of the permanently fenced facilities (i.e., fiber optic line, highway fence, natural gas distribution line), BrightSource will perform pre-activity clearance surveys and employ monitors to move desert tortoises out of harm's way if they re-enter work areas. For these reasons, we anticipate that construction, including construction access, is likely to kill few if any individuals larger than 160 millimeters. Some potential always exists that surveyors may miss an individual during clearance surveys and construction monitoring. We cannot predict how many of these larger desert tortoises that clearance surveys and construction monitoring would miss. However, because BrightSource will use qualified biologists, authorized by the Service for clearance surveys, we anticipate that the number is likely to be small.

In addition, desert tortoises that are smaller than 160 millimeters and desert tortoise eggs are difficult to detect and clearance surveys and construction monitoring are likely to miss most of these individuals. These individuals are likely to remain in the work areas during construction. BrightSource is likely to kill these desert tortoises during construction. Based on the Environmental Baseline section of this biological opinion, we estimate that between 15 and 56 desert tortoises between 120 and 160 millimeters (point estimate of 30) may occur on Units 2 and 3. In our analysis of translocation effects, we predicted that surveyors would find 44 percent of these desert tortoises, leaving between 9 and 32 desert tortoises in this size class (point estimate of 17) that would likely die during construction of Units 2 and 3.

In the Environmental Baseline section we also estimated that between 181 and 684 non-hatchling desert tortoises that are smaller than 120 millimeters (point estimate of 359) may occur on Units 2 and 3. We previously estimated that Unit 1 and the CLA contained approximately 112 individuals in this size class, of which, clearance surveys located 8 (7.1 percent) (Woodman 2011a). Based on our population estimate for this size class on Units 2 and 3 and our estimated detection percentage from Unit 1 and the CLA, we estimate that construction of Units 2 and 3 could kill between 169 and 636 non-hatchling desert tortoises that are smaller than 120 millimeters (point estimate of 334).

Finally, we estimated in the Environmental Baseline that Units 2 and 3 could contain between 99 and 373 desert tortoise hatchlings or eggs (point estimate of 196). Because construction activities on Units 2 and 3 would occur year round, we cannot predict whether these activities would affect the hatchling or egg stage. Consequently, we have combined these stages in our estimation of effects. For Unit 1 and the CLA, we estimated that 34 desert tortoise hatchlings were potentially present during clearance surveys, of which, BrightSource located 4 (i.e., 11.8 percent). Assuming a similar clearance rate for Units 2 and 3, we estimate that BrightSource could clear between 11 and 44 desert tortoises hatchlings. We anticipate that detection of eggs is unlikely. Based on our population estimate for this size class on Units 2 and 3 and our estimated detection percentage from Unit 1 and the CLA, we estimate that construction of Units 2 and 3 could kill between 88 and 329 desert tortoise hatchlings or eggs (point estimate of 173). As discussed in the previous section, only a small portion of this mortality (i.e., loss of individuals that are close to recruitment) could have any meaningful effect on overall population trends.

Effects Associated with Construction of Linear Facilities

BrightSource has currently fenced Unit 1 and portions of Units 2 and 3 with desert tortoise exclusion fencing under the 2010 biological opinion. Because these are linear facilities and have different effects on desert tortoises relative to their construction, we have analyzed them here rather than grouping their effects with our analysis of the overall effects of construction of the solar fields. During installation of fencing, BrightSource moved individuals out of harm's way and continues to monitor these individuals. In the previous section, we indicated that two desert tortoises died along the fence line.

Going forward, BrightSource would install the 8-mile-long fiber-optic line to Mountain Pass, install the 7-mile-long fence along Interstate 15 between Nipton Road and Yates Wells Road, extend existing access route fencing from Colosseum Road out to the interstate, install culverts under Colosseum Road to reduce population fragmentation, install temporary desert tortoise exclusion fencing around the outside-home-range translocation site, and complete installation of the natural gas distribution line. We anticipate that overall habitat disturbance associated with this activity would be less than 200 acres based on the location, length, and overall habitat disturbance associated with these activities. BrightSource would have to capture, handle, and

move desert tortoises from construction areas. The location of all of these activities overlaps largely with translocation recipient sites surveyed in the spring of 2011. In the Environmental Baseline, we indicated that the density of individuals larger than 160 millimeters within the recipient sites was as high as 40 per square mile in some areas. Based on this information and the amount of surface disturbance that we anticipate (i.e., less than 200 acres), we anticipate that BrightSource would move few desert tortoises. We anticipate that construction activities, capture, handling, and movement of desert tortoises out of harm's way will result in direct effects in the form of injury or mortality of few desert tortoises for the reasons discussed previously. We expect the number that would be injured or killed to be small due to the numerous protective measures that the Bureau has proposed. We do not anticipate that this potential injury or mortality will substantially change the overall effects of the project.

In addition to direct effects in the form of injury and mortality of individuals due to fence installation activities, desert tortoises would die when exposed to harsh conditions (i.e., cold or hot temperatures) while pacing fences. Increased monitoring of fence lines and the Bureau's requirement that BrightSource immediately translocate any individual exhibiting "fence line distress", should reduce the potential for injury or mortality in the future. Finally, installation of fencing may also reduce the home range size of some individuals that inhabit areas immediately adjacent to the fence alignments. This reduction could result in future injury or mortality of these individuals as they expand their home range into adjacent areas where unknown threats may occur or where adverse social or competitive interactions may occur with neighboring desert tortoises. We cannot predict the number of desert tortoise home ranges that project fence alignments might affect.

Effects of Operations and Maintenance Activities

Following fencing, operation and maintenance activities within permanently fenced areas are unlikely to injure or kill any desert tortoises. However, we have discussed additional indirect effects associated with operation and maintenance of this facility in the Miscellaneous Effects section later in this biological opinion.

Over the 30-year life of this project, BrightSource may conduct some ground-disturbing maintenance activities outside of fenced areas. These activities have the potential to injure or kill desert tortoises primarily as a result of vehicle strikes, as workers travel to and from work sites outside of the fenced areas; a limited possibility exists that desert tortoises could be injured or killed by equipment or workers moving around a work site. Because Class I maintenance activities would not result in surface disturbance or loss of habitat and BrightSource would implement protective measures to reduce the potential for effects to desert tortoises, Class I maintenance activities would kill few, if any, desert tortoises.

Class II maintenance activities associated with repair of desert tortoise exclusion fencing would likely kill or injure few, if any, desert tortoises for the following reasons: 1) fence repairs are likely to result in minimal ground disturbance in localized areas, 2) at least a portion of the work

area would be on disturbed areas within the fenced project site, 3) perimeter roads would exist that would allow access to most repair locations with minimal off-road travel, and 4) BrightSource would implement numerous protective measures to reduce the potential for injury or mortality of desert tortoises.

Because we do not have sufficient detail regarding the other types of maintenance activities discussed in the Description of the Proposed Action, we cannot adequately analyze the potential for injury or mortality of desert tortoises. Consequently, we are not analyzing Class III maintenance activities or any Class II maintenance activities that would occur outside of the fence and not be associated with repair of fencing. The Bureau has indicated that these actions would require future site-specific authorizations. At the time the Bureau considers authorization of these future activities, it will need to determine whether these future activities may affect desert tortoises. Some of these actions may require future site-specific consultation under section 7.

Effects of Restoration/Reclamation Activities

Decommissioning or restoration activities within the permanently fenced project area are unlikely to result in injury or mortality of desert tortoises. BrightSource will also need to perform restoration of long-term and short-term disturbance associated with the natural gas distribution line and fiber optic line. BrightSource would implement pre-activity clearance surveys and employ desert tortoise monitors to ensure that desert tortoises do not enter restoration work areas. Consequently, restoration activities will injure or kill few, if any, desert tortoises. These actions are likely to reduce the amount of time required to return disturbed areas to habitat suitable for desert tortoise occupancy. However, this process is likely to take several decades.

Effects of Loss of Habitat

With the exception of minor habitat loss associated with the installation of perimeter fencing around the Interstate 15 translocation area and along Yates Well Road, the anticipated habitat loss associated with this project has not changed since the previous consultation. However, the following analysis provides a more detailed assessment of the effects that this habitat loss would have on desert tortoises in Ivanpah Valley and on desert tortoises within the recovery unit.

The biological assessment for the 2010 consultation defined permanent, long-term, and short-term disturbance as follows:

- Permanent Disturbance: project disturbance that would remain after the project's lifespan.
- Long-term Disturbance: project disturbance that would remain in place for the lifespan of the project, but would be restored following closure.

- Short-term disturbance: project disturbance restored within 5 years of the time of the disturbance.

Based on these definitions and the project description provided in the biological assessment, construction of the 3 project phases and the CLA, including installation of exclusion fencing, and improvements to Colosseum Road would result in 3,321.9 and 122.1 acres of permanent/long-term and short-term disturbance, respectively (CH2MHill 2009a). Installation of the natural gas distribution line and associated facilities will result in an additional 1.7 and 6 acres of new permanent/long-term and short-term disturbance. We anticipate that installation of fencing along Interstate 15 would temporarily disturb approximately 9.1 acres of desert tortoise habitat.

The following table, adapted from table 2.1-1 of the revised biological assessment (CH2MHill 2010a), provides details regarding the disturbance associated with each project feature.

Permanent and Long-term Disturbance	**Acres**
Ivanpah 1	913.5
Ivanpah 2	1,097
Ivanpah 3	1,227
CLA and SCE Substation	68.4
Gas Line	1.7
Colosseum Road	14.3
Total	**3,321.9**
Short-term disturbance	
CLA and SCE Substation	115.6
Gas Line	6.0
Construction areas for linear corridors	10.4
Credit for existing roads within project area	-9.9
Total	**122.1**

Based on the definitions above, we estimate that installation of the fiber optic line would result in approximately 0.28 acre of new short-term disturbance. In addition to the disturbances associated with construction of the ISEGS facility, Class II and III maintenance activities are likely to result in additional habitat disturbance over the 30-year life of the project. Based on the information provided, we cannot estimate the amount of disturbance associated with some Class II activities (i.e., those outside of the project site) or any Class III maintenance activities over the life of the project. We are not analyzing these activities in the biological opinion because they will require future authorizations from the Bureau.

These permanent, long-term and short-term disturbances will result in desert tortoise habitat loss that will persist for various periods. Following extensive disturbance and compaction, Mojave Desert soils can take between 92 and 124 years to recover in the absence of active

restoration (Webb 2002). In addition, recovery of plant cover and biomass in the Mojave Desert can require 50 to 300 years in the absence of restoration efforts (Lovich and Bainbridge 1999). Although active restoration, including decompaction, seeding, and planting, can reduce the time required to restore desert ecosystems, success is varied and dependent on numerous variables. Based on this information, 3,321.9 acres, currently characterized as permanent/long-term disturbance, are likely to be permanently lost or unsuitable as habitat for several decades following decommissioning of the facilities and commencement of restoration work. Because active restoration will occur, we estimate that BrightSource will restore 122 acres of short-term disturbance to desert tortoise habitat prior to decommissioning of the facility. Based on the information provided, we cannot estimate the amount or duration of habitat loss associated with some Class II activities (i.e., those occurring outside of the project fence) or any Class III maintenance activities. Consequently, we are not analyzing the effects of these activities in this biological opinion. The Bureau has indicated that these actions will require future Bureau authorizations.

In the Status of the Species section of this biological opinion, we estimated that the Northeastern Mojave Recovery Unit contained approximately 5,600 square miles of desert tortoise habitat, of which some is composed of degraded habitat that likely supports low-density desert tortoise populations. Therefore, we anticipate that construction of the 5-square-mile ISEGS project would disturb less than one percent of the desert tortoise habitat in the Northeastern Mojave Recovery Unit. Although this percentage does not constitute a numerically substantial portion of the Northeastern Mojave Recovery Unit, the location of the habitat loss associated with ISEGS, in conjunction with other existing and foreseeable habitat loss in the action area, has the potential to affect population connectivity in the Ivanpah Valley. We have discussed those effects below.

Effects of Population Fragmentation

All recent genetic studies of the desert tortoises have concluded that its population structure is characterized by isolation-by-distance (Britten et al. 1997, Edwards et al. 2004, Murphy et al 2007, Hagerty and Tracy 2010). In addition, the historic distribution of desert tortoises was relatively continuous across the species' range, broken only by major topographic barriers (Germano et al. 1994, Nussear et al. 2009). Genetic analysis also suggests that, historically, levels of gene flow among subpopulations of desert tortoises were likely high, corresponding to high levels of habitat connectivity (Murphy et al. 2007). All of this suggests that gene flow in desert tortoises generally occurs according to a continuous-distribution model (Allendorf 2007), as opposed to a metapopulation or stepping-stone model where individuals move from one patch of suitable habitat to another, across less suitable habitat.

Hagerty et al. (2011) concluded that geographic distance and the presence of geographic barriers provide the most reliable predictors for population structure in the desert tortoise and they used these predictors to model how these variables historically affected population connectivity on a landscape scale. This modeling indicates that historic population connectivity

in the Northeastern Mojave Recovery Unit and Ivanpah Valley was constrained through geographic and topographic bottlenecks. Because of these constrictions, the following analysis focuses on how the ISEGS facility, in combination with other barriers in the action area, will affect dispersal, gene flow, and population viability in the Ivanpah Valley. In addition, we address the relative contribution of the ISEGS facility to these effects in context with the other existing and approved developments within the valley.

Existing Population Linkages near Primm

Croft (2011d) provides a map of current or proposed developments in relation to the modeled linkages in Hagerty et al. (2011). The developments that have already affected or have the potential to affect dispersal and population connectivity in this corridor include ISEGS, portions of Interstate 15, Primm, the First Solar Silver State project, the Primm Valley Golf Course, an existing electrical substation near the proposed Silver State project, and the southern boundary fence of the Clark County large-scale translocation site (LSTS). The LSTS lies west of Interstate 15, south of Goodsprings Road, east of the Spring Mountains, and approximately 3 miles north of Stateline, Nevada. The portion of the fence along the southern boundary is approximately 1.2 miles long from Interstate 15 to the edge of the Spring Mountains. This fence is maintained and monitored regularly to ensure that desert tortoises are contained within the LSTS. The location, purpose, and continued maintenance of this fence virtually severs connectivity of desert tortoise populations within this recovery unit west of Interstate 15.

Additional developments in this area would also fragment habitat, but they are not likely to further block connectivity because dispersal and gene flow can occur through adjacent, intact habitat or they are permeable barriers (i.e., contain culverts or other passages that span a very short distance that allows for animals to move back and forth). These developments include Nipton, Nipton Road, MorningStar Mine Road, Ivanpah Road, unpaved roads, the Kern River pipelines, the Molycorp Wastewater Pipeline, the proposed Desert Express railroad, the Union Pacific Railroad, the Eldorado to Ivanpah Transmission Line, and other high-voltage power lines and fiber-optic lines that cross the Ivanpah Valley. However, human activities associated with these developments likely injure or kill several desert tortoises per year. These continued human-caused losses contribute to a decreased level of population viability in the action area.

Based on the location and extent of the existing and approved projects within the Ivanpah Valley, four potential linkages between the Clark and Lucy Grey Mountains would exist following construction of currently approved projects (Croft 2011d). The first potential linkage would be to the east of the proposed Silver State project (between the project and the Lucy Grey Mountains) and would be approximately 1.5 miles wide at its narrowest point. The second potential linkage would be to the north of the ISEGS project and the west of Primm (between the project and the Clark Mountains). The third potential linkage would be between the ISEGS project site and the Primm Valley Golf Course and would feed into the linkage described above that is to the north of ISEGS and west of Primm. The fourth potential linkage would be

between the town of Primm and an existing electrical substation, and would be approximately 0.5 mile wide (Croft 2011d).

Long-term Viability of Existing Linkages

Individual desert tortoises can make long-distance movements, which can contribute to gene flow (Berry 1986, Edwards et al. 2004), but we do not know the extent to which individuals will traverse long narrow corridors of relatively intact habitat. Given this uncertainty, reliable connectivity of populations depends upon the existence of enough suitable and occupied habitat to maintain sustainable populations. Consequently, the long-term viability of the four linkages depends on the ability for the habitat in these linkages to sustain populations into the future and the absence of significant barriers to dispersal. The following discussion analyzes the likelihood that the linkages would maintain sustainable populations and population connectivity into the future.

To define the area required to maintain populations within the linkages, we considered desert tortoise home range size, resource availability, and the magnitude of edge effects. Turner et al. (1981 in Berry 1986) documented home ranges of desert tortoises in the Ivanpah Valley to be as large as 220 acres. However, a desert tortoise's home range can expand and contract over the course of its life as it responds to year-to-year variability in resource availability. Over their lifetime, individual desert tortoises may use 1.5 square miles of habitat in adjusting their home ranges to address this variability (Service 1994). Therefore, we assess the viability of the linkages based on the ability of those linkages to maintain the lifetime desert tortoise utilization area of 1.5 square miles or the ability of utilization areas of this size to connect to one another through a relatively short linkage. Because the lifetime utilization area considers the expansion and contraction of desert tortoise home range size over time, it allows us to consider whether the linkage could remain viable in a year where decreased resource availability results in a smaller population of individuals requiring larger home ranges.

In assessing the lifetime utilization area, the Service (1994) assumed a circular configuration of this area when using it in the population viability assessment. We based this assumption on the fidelity that desert tortoises exhibit towards an overwintering burrow year after year. Consequently, the overwintering burrow serves as an anchor point from which the lifetime utilization area radiates out (Service 1994). Using a circular lifetime utilization area of 1.5 square miles for a desert tortoise, we estimate that a linkage would need to be at least 1.4 miles wide to accommodate the width of a single desert tortoise's lifetime utilization area. Croft (2011d) mapped circular 1.5-square-mile areas within the 4 potential linkage areas described above. This mapping shows that the linkages are of sufficient width to accommodate the diameter of these circular utilization areas. Although these figures provide a means for characterizing the potential minimum width of a linkage, the actual linkage-width needs will be highly dependent on the actual site-specific configuration and size of desert tortoise home ranges in that area, the terrain within the linkage, and the degree to which threats, constrictions,

and edge effect will disrupt the linkage. The following discussion discusses the long-term viability of each linkage.

Because of its narrowness and the current level of human impacts within and adjacent to it, the linkage between Primm and the Silver State project will not likely provide any reliable level of population connectivity. The linkage to the north of Unit 3 of ISEGS and west of Primm has already experienced habitat loss due to the installation of the Kern River Gas Transmission Lines and several large transmission lines; the DesertXpress rail line would also be placed in this linkage. This linkage is also virtually severed north of Primm because of the location of the LSTS southern boundary fence and Interstate 15. Interstate 15 also blocks the southern end of this linkage. Although culverts and underpasses, north of Primm and west of Roach Lake, and between Yates Well Road and Nipton Road offer some small potential for population connectivity through this area, we anticipate that dispersal of desert tortoises through these underpasses does not likely contribute significantly to population connectivity.

The linkage east of the Silver State project has the lowest level of existing habitat degradation and likely provides the most reliable potential for continued population connectivity. However, desert tortoises may not persist within this linkage during years of low resource availability; they may die or move to other areas. Climate change may exacerbate this potential effect, given that temperatures are expected to rise; the effects of climate change on rainfall are less predictable at this time. An overall rise in temperature would increase the environmental variability that desert tortoises face and increase the likelihood that a small number of desert tortoises, within these narrow linkages, would perish in any given year from catastrophic events or other sources of mortality associated with edge effect. Desert tortoises occupying these linkages also would be vulnerable to periodic loss from stochastic events (i.e., the few desert tortoises occupying the linkages are more likely to die out due to random chance).

A stochastic event, such as a fire or disease outbreak, could cause a decline in the number of desert tortoises throughout the valley or in a substantial portion of it. Rising temperatures resulting from climate change would likely exacerbate the effects of any such stochastic event, because of the increase in environmental variability in the region. (The effects of climate change on rainfall are less predictable at this time.) An increase in environmental variability would likely lower the overall survival rate of desert tortoises because they may be less likely to survive the wide variation between good and poor years in terms of resource availability.

Under such conditions, desert tortoises occupying this narrow linkage area, which would also continue to be affected by the anthropogenic effects occurring in these areas that we described in the Environmental Baseline - Existing Conditions in the Action Area section of this biological opinion, may be more susceptible to local extirpation than individuals that reside in a larger area of habitat. With the overall number of desert tortoises in the area reduced as a result of the stochastic event, individuals may be less likely to find mates, reproduce, and recolonize the linkage areas, particularly if desert tortoises in these areas are subject to ongoing causes of mortality.

Although the linkage to the east of the Silver State project is narrow, it will accommodate the width of a desert tortoise's lifetime utilization area and is likely wide enough to maintain a population at some level during times of low resource availability when desert tortoises may have to expand their year-to-year home ranges within the linkage to obtain necessary resources. However, existing and future habitat degradation from development within and adjacent to this linkage may reduce the capacity of it to support viable populations in years of poor resource availability. We cannot determine the probability that this linkage would be lost in the future, but the compromised nature of the other linkages in the vicinity of Primm makes this linkage critically important. Although we cannot predict that the development in the vicinity of Primm would result in loss of population connectivity, we have provided the following discussion of potential effects associated with this possibility.

Effect of the Loss of Population Connectivity in the Vicinity of Primm

The loss of connectivity between the northern and southern ends of Ivanpah Valley would have far-reaching implications if it occurred because of the confined nature of the population in the Ivanpah Valley. Hagerty et al. (2011) showed that historic connectivity through the southern end of Ivanpah Valley near Cima is narrowly constrained by topographic barriers. This constriction is sufficient to contain the width of two desert tortoise lifetime utilization areas (Croft 2011d). However, Nussear et al. (2009) identified this area as having a lower probability to support desert tortoises based on habitat attributes; additionally, no desert tortoises were detected in this area during line-distance sampling from 2007 through 2010 (Service 2009b, 2010f, 2010g). Considering the narrow width of this linkage, its low habitat potential, and existing habitat impacts and degradation within the linkage (i.e., the Union Pacific Rail Road line, Morningstar Mine Road, unpaved roads, past cattle grazing, etc.), existing population connectivity through the southern end of the valley is likely severely constrained. Consequently, loss of connectivity in the vicinity of Primm would likely create a nearly closed population in the southern end of the Ivanpah Valley.

The Service (1994) provided a population viability analysis for the desert tortoise to inform its recommended reserve designs during recovery planning. Based on this analysis, the Service concluded that the minimum viable population density for a population of desert tortoises was 10 adult desert tortoises per square mile; below this density, demographic stochasticity and genetic deterioration likely diminish the potential for population growth (Service 1994). This analysis also concluded that a minimum area of 1,000 square miles is needed to maintain evolutionary potential at a minimum viable density of 10 adults per square mile due to the patchy distribution of desert tortoises across the landscape. The Service (1994) also concluded that the time to extinction for small populations was strongly related to population size (i.e., smaller populations went extinct faster) and that lambda (i.e., population growth rate) needed to remain above 1 to avoid becoming extremely vulnerable to extinction.

Loss of population connectivity near Primm and Cima could create a nearly closed population of desert tortoises within a 317-square-mile area in the southern portion of the Ivanpah Valley. The most recent 4-year average density of desert tortoises in the Ivanpah Critical Habitat Unit, which contains the southern portion of the Ivanpah Valley, is approximately 12.2 adult desert tortoises per square mile (Service 2009b, 2010f, 2010g). This density is based on the sampled areas of the entire Ivanpah Critical Habitat Unit and may not reflect conditions in this smaller area. Given the small size of the area that development within the Ivanpah Valley could isolate, the relatively small population that currently occupies it, the ongoing sources of mortality in this area that we discussed in the Environmental Baseline, and the existing conditions in the Ivanpah Valley, this population, if isolated, would likely experience the demographic and genetic effects discussed in the population viability assessment.

Isolation of the Ivanpah Valley to the north would also have negative implications for desert tortoise populations in the Eldorado Valley of Nevada. The desert tortoise population in Eldorado Valley lies within the "South Las Vegas" genetic cluster with the Ivanpah Valley population (Hagerty and Tracy 2010). Even though the Eldorado and Piute valleys are often considered together for management purposes, the Piute Valley population is aligned with desert tortoise populations in the "Northern Colorado" genetic cluster to the south (Hagerty and Tracy 2010). Eldorado Valley is already disconnected by Las Vegas and Boulder City from tortoise populations to the north and has likely experienced population declines as discussed in the Status of the Species Section. If development in the Ivanpah Valley severed population connectivity, it would essentially isolate the Eldorado Valley population from the rest of the recovery unit.

We have addressed the potential long-term effects of loss of population connectivity in the vicinity of Primm to ensure a broadscale analysis of this issue. However, there is no information to indicate whether loss of the connectivity is probable because the linkage to the east of the Silver State project is still viable. Currently, this linkage is not threatened by existing or future development, and we cannot determine the probability that it would be compromised in the future by drought or other stochastic events. The Service (2010h) has also concluded that connectivity was likely to be maintained through this linkage.

Effects of the ISEGS Project on Population Connectivity and Fragmentation

Although the available information does not support a conclusion that connectivity would be lost in the vicinity of Primm, leading to population-level genetic and demographic effects in the southern end of the Ivanpah Valley, the existing effects of fragmentation caused by the LSTS fence, Interstate 15, Primm, and the Clark Mountains are likely to be exacerbated by the development of the ISEGS facility. Although culverts and underpasses, north of Primm and west of Roach Lake, and between Yates Well Road and Nipton Road, offer some small potential for population connectivity to this area, we have concluded that dispersal of desert tortoises through these underpasses does not likely contribute significantly to population connectivity. This lack of significant connectivity has resulted in a population west of Interstate

15 that is completely or nearly isolated from the remainder of the desert tortoise population in the southern end of the Ivanpah Valley.

The isolated population west of Interstate 15 is significantly smaller than the minimum viable population size identified in Service (1994), indicating that it is highly vulnerable to demographic stochasticity and genetic deterioration. The development of the ISEGS facility in the area occupied by this isolated population is likely to promote or exacerbate these effects by reducing the area available to this population and introducing additional mortality sources that may reduce population recruitment or create demographic imbalances. The potential mortality of juvenile individuals on the ISEGS project site will also likely have some effects on population recruitment (i.e., individuals reaching reproductive age). In addition to exacerbating demographic and genetic effects within this small population, the ISEGS facility would further fragment the small population west of Interstate 15 by constraining connectivity between populations east and west of the facility. However, because population connectivity would still remain to the north of Unit 3 and BrightSource would install culverts underneath its access road to alleviate fragmentation associated with it, we anticipate that populations to the west and east of ISEGS would still largely be connected.

We have concluded that the population west of Interstate 15 is likely isolated and suffering from demographic stochasticity and genetic deterioration because of existing barriers that greatly reduce the potential for movement (Service 1994). However, we currently have no information on the demographics of the population west of Interstate 15 or the degree to which individuals move between this population and populations in the surrounding area. Consequently, without this information we cannot confirm or estimate the magnitude of the effect associated with the development of ISEGS on the viability of this population. The Bureau has proposed a genetic and demographic monitoring and adaptive management program that will likely address these effects if they occur. In addition, the delayed translocation of smaller sized individuals from the project will offset, to some degree, the loss of recruitment associated project site mortality of pre-reproductive individuals.

Miscellaneous Effects

Indirect effects associated with construction, operation, maintenance, and decommissioning of the ISEGS facility may injure or kill desert tortoises. These effects include increased predation by common ravens that are attracted to the area because of increased human activity and modification of the habitat and diet of desert tortoises due to the spread of non-native plant species. Ivanpah Valley currently supports numerous facilities that attract common ravens (e.g., water sources, trash, road-killed animals, nest and roost sites, etc.); these facilities are associated with established communities (i.e., Primm, Nevada and Nipton, California), golf courses, an interstate highway, and utility lines that are likely to elevate the level of predation of desert tortoises by common ravens within the action area. Construction and operation of the ISEGS facility has the potential to attract additional common ravens and increase predation in the action area. BrightSource has proposed numerous measures to address predation by common

ravens associated with the project site. These measures include control of raven attractants, a monitoring program, and contingencies for removal of problem common ravens. In addition, BrightSource will provide funds for implementation of regional management actions for common ravens.

We cannot reasonably predict the amount of predation by common ravens that construction and operation of this project is likely to add to baseline levels within the action area, but we anticipate that the program proposed by BrightSource is likely to be effective in eliminating some, but not all, common raven use of the project site. Depending on the location of specific control actions, funding of regional management of common ravens may also aid in reducing the amount of common raven predation on desert tortoises within the action area.

Non-native plant species currently occur on the proposed project site and are likely to occur in other portions of the action area at varying densities. Within Ivanpah Valley, numerous features serve as vectors for infestation of the action area by non-native plant species (e.g., highways, cattle allotment). However, construction and operation of the ISEGS facility has the potential to increase the distribution and abundance of non-native species within the action area due to ground-disturbing activities that favor the establishment of non-native species. In addition, access to the project site and other project features by construction and operations personnel is likely to increase the volume and distribution of non-native seed carried into the action area. The increased abundance in non-native species associated with this project may result in an increased fire risk, which may result in future habitat loss.

BrightSource has proposed numerous measures to address control of non-native plant species within the project site. We cannot reasonably predict the increase in non-native species abundance that this project will create within the action area, but we anticipate that the program proposed by BrightSource will be reasonably effective in reducing the increase in some species. However, BrightSource has not proposed any measures to control species, such as red brome, that are ubiquitous in the area. Increases in the abundance of this species elevate the risk of fire, which, in turn, heightens the risk of future habitat loss, which could reduce the number and distribution of desert tortoises within the action area. We anticipate that BrightSource's use of herbicides in control of weeds would have minimal effects because these herbicides would be used within fenced areas that do not contain desert tortoises.

Effects of Compensation

The Bureau has required compensation for loss of habitat associated with this project at a ratio of 1:1 per the provisions of the Northern and Eastern Mojave Plan. Compensation will include acquisition of private lands containing desert tortoise habitat and their transfer to the Bureau, implementation of habitat enhancement and rehabilitation projects on public land, or some combination of these actions. The Bureau would implement all of these compensation requirements within the Northeastern or Eastern Mojave Recovery Unit.

Potential habitat enhancement and rehabilitation actions that the Bureau has proposed, include highway fencing, fencing the boundary of two desert residential communities, non-native plant control, rehabilitation of closed routes, and identification and clean up of degraded sites (i.e., illegal dumps, illegal routes). All actions would occur within or would benefit desert wildlife management areas or other areas that are important to desert tortoise conservation in the Northeastern Mojave Recovery Unit or in nearby areas in the Eastern Mojave Recovery Unit.

In addition to the Bureau's required compensation, the California Energy Commission required BrightSource to compensate for the loss of desert tortoise habitat at a ratio of 2:1. Although these funds may be spent in locations outside of the Northeastern Mojave Recovery Unit, at least some funds are likely to be expended within the unit; we expect that these funds would be used to implement actions similar to those implemented by the Bureau and would also result in actions that would promote the conservation of the species. The California Energy Commission has also required BrightSource to provide funding for the implementation of regional management programs for the common raven.

Although acquisition of suitable desert tortoise habitat through these compensation requirements will not create new habitat within the Northeastern Mojave Recovery Unit, it will result in a net increase in the amount of desert tortoise habitat managed for the conservation of this species. (The amount of acquired land may not equal the amount of habitat that is disturbed because relatively little private land remains in this portion of the desert.) In addition, the funding of management actions and regional management of common ravens are likely to result in restoration and rehabilitation of degraded habitat, protection of existing habitat from future sources of degradation, and a reduction in the direct mortality of desert tortoises. In general, the original and draft revised recovery plans (Service 1994, 2008c) identify the actions proposed for compensation as being necessary for the recovery of the desert tortoise. We cannot quantify the level of effects that these actions will have because we cannot assess the specific actions that will be implemented at this time. Because habitat enhancement actions and land acquisition would occur in desert wildlife management areas or other locations that are important to desert tortoise conservation, the proposed compensation requirements would provide a positive recovery benefit to the desert tortoise and at least partially offset loss of habitat associated with the project.

Implementation of some of the habitat enhancement actions has the potential to result in adverse effects to the desert tortoise. Because we do not have specific information regarding future habitat enhancement and rehabilitation projects, we cannot perform a detailed analysis of these actions. The Bureau has indicated that these actions would require future project-specific authorizations prior to implementation. Consequently, we will address their adverse effects to the desert tortoise in future project-specific section 7 consultations.

Summary of Effects

Based on the results of clearance surveys of Unit 1 and the CLA and the 2011 pre-project surveys of Units 2 and 3, we estimate that BrightSource would translocate between 103 and 246 project-site desert tortoises larger than 120 millimeters (point estimate of 156) over the next 5 years. All of these individuals are either currently in quarantine or would be placed in quarantine for some time prior to translocation. Because BrightSource will not translocate any individuals smaller than 120 millimeters, some of these individuals may remain in quarantine for up to 5 years. Because BrightSource will implement a variety of measures to reduce stress to these animals, we do not anticipate that injury or mortality will result from handling or short-term quarantine; short-term quarantine pertains to those animals that remain in quarantine only long enough for testing to occur and the appropriate translocation release period to arrive. However, we estimate that between 25 and 43 desert tortoises (point estimate of 31) will die during the long-term quarantine that is required for some individuals to reach 120 millimeters. We anticipate that this mortality rate is lower than what individuals within this size class would experience in the wild.

Following release of translocated animals, we anticipate that between 26 and 62 translocated desert tortoises (point estimate of 39) will die due to predation, exposure, fire, disease, crushing by cattle, road kills, or flooding during the 10-year monitoring period. In addition, some resident desert tortoises in the recipient sites are likely to die due to the same causes of mortality. However, based on the available information, we have concluded that mortality rates within the resident and translocated populations are unlikely to be above what they would experience in the absence of translocation, as would be demonstrated in the control population, and we do not anticipate that the act of moving desert tortoises will cause an increase in mortality as compared to the control population. If post-translocation monitoring indicates elevated levels of mortality in resident and translocated populations, re-initiation of consultation may be required to address this unanticipated effect.

We also anticipate that BrightSource would monitor between 309 and 738 desert tortoises (point estimate of 468), which would include the translocated animals described above, for a period of up to 10 years. Over this period, BrightSource could capture and handle each individual multiple times to facilitate transmitter replacement, health assessments, and periodic blood sampling. Some potential exists that handling of desert tortoises and blood collection could result in elevated levels of stress or injury, if done improperly. However, we anticipate that the number of desert tortoises that may be injured would be minimal because BrightSource would use experienced biologists authorized by the Service to perform these activities.

Because BrightSource's construction activities would continue to occur within areas that have been fenced and cleared of desert tortoises, we anticipate that construction of the ISEGS project, including use of access routes, is likely to directly kill or injure few desert tortoises larger than 160 millimeters. Because of the difficulty in detecting smaller animals, we estimate that construction of Unit 1 may have killed as many as 139 desert tortoises smaller than 160

millimeters. In addition, we estimate that construction of Unit 2 and 3 may kill or injure between 178 and 668 non-hatchling desert tortoises that are smaller than 160 millimeters (point estimate of 351). Finally, we estimate that project construction on Units 2 and 3 may kill or destroy between 88 and 329 desert tortoise hatchlings or eggs (point estimate of 173).

We also anticipate that construction of linear facilities (i.e., fiber optic line, access road fencing, project-site perimeter fencing, and recipient site fencing) may kill or injure a small number of desert tortoises due to adverse effects associated with fence pacing. In addition, fence installation has the potential to injure or kill some desert tortoises by displacing them from portions of their existing home ranges. We cannot predict precisely how many desert tortoises the construction of linear facilities and fence installation would affect because we do not know how many desert tortoises would have home ranges that overlap fence alignments.

Use of a life table to estimate the number of desert tortoises in smaller size classes has numerous sources of error and is likely an overestimate, but the magnitude of the overestimate is unknown. However, it provides a reasonable method for looking at how mortality in a cohort over time may affect the number of individuals that reach the 160-millimeter size class. Although this method likely overestimates the population size, thereby overestimating the adverse effects, it is an appropriate way to assess the effects of this project on the desert tortoise population.

Following construction, we do not anticipate that operations, maintenance, or restoration and reclamation activities within the permanently fenced portions of the ISEGS facility or regular access to the ISEGS facility along Colosseum Road will injure or kill desert tortoises. Because BrightSource will implement numerous protective measures, restoration activities in unfenced work areas are unlikely to injure or kill desert tortoises. We cannot accurately predict the number of desert tortoises that most Class II maintenance activities would kill or injure outside of the fenced project site because we do not have sufficient information to predict the location, frequency, or magnitude of these actions. However, Class I activities and Class II maintenance activities associated with fence repair would kill or injure few, if any, desert tortoises because of the nature of these activities and the protective measures that BrightSource would implement. Class III maintenance activities and Class II maintenance activities occurring outside of the project site would require future consultation.

Construction, operation, maintenance, and decommissioning of the ISEGS facility have the potential to increase common raven predation on desert tortoises within the action area. In addition, this project is likely to result in an increased abundance of non-native plant species and a subsequent increase in fire frequency within the action area. The measures proposed by BrightSource to address these threats will reduce the magnitude of these effects, but some level of adverse effect will likely persist. We cannot reasonably predict the number of desert tortoises that these threats will adversely affect.

Because desert tortoises are long-lived creatures and females can produce large numbers of offspring each year, the magnitude of the population level effects associated with desert tortoise mortality depends largely on the size class in which the mortality occurs and the local mortality rate for reproductive females. Several demographic models indicate that desert tortoises require high levels of survivorship and recruitment (i.e., survival to reproductive age) to recover mortality of reproductive adults in a declining population (Congdon et al. 1993, Doak et al. 1994, and Service 1994). Desert tortoises do not typically reach reproductive age until they are 12 to 25 years old (Turner et al. 1984). Once adults reach reproductive age, they can live for more than 80 years and produce offspring for their entire reproductive lifespan (approximately 50 to 60 years) (Service 1994). To maintain a stable population in the Ivanpah Valley, the number of individuals reaching reproductive age (i.e., surviving from hatchling stage for 12 to 25 years) must regularly replace the number of reproductive adults that die in the population. If mortality of adult females is high, then the population requires a higher survival of smaller size classes or the population will decline in size over time. Data are not available for us to analyze the current trend in adult population size within the Ivanpah Valley, so we cannot provide a precise analysis of the effect associated with loss of smaller size classes. Natural mortality of adult desert tortoises and mortality and habitat degradation associated with other projects will occur within the action area while ISEGS is in operation. In combination with this mortality, we anticipate that mortality of smaller size classes as a result of the proposed action, especially those that are close to reproductive age, will have a negative effect on population stability within some local portions of Ivanpah Valley that are close to the project site. We do not anticipate that it would affect a large enough portion of the population to affect substantially the overall population trend within the recovery unit or range wide. In addition, increased juvenile survival associated with desert tortoises held in the quarantine facility for up to 5 years prior to release may help to offset the initial impacts to recruitment associated with direct loss of individuals during construction.

Project development will result in 3,321.9 acres of long-term or permanent disturbance to desert tortoise habitat. Although all of this area, except for the permanent facilities (i.e., SCE substation and gas metering stations), will undergo restoration and reclamation work, it is unlikely to function as suitable desert tortoise habitat for many years following facility closure. We cannot predict the amount of time required to return areas of long-term disturbance to suitable desert tortoise habitat because of numerous variables associated with restoration success, including the timing and amount of rainfall. We estimate that BrightSource will return an additional 122.1 acres of short-term disturbance to suitable desert tortoise habitat by the end of the 30-year project lifespan.

In the Status of the Species section of this biological opinion, we indicated that the density of desert tortoises within sampled areas of the Northeastern Mojave Recovery Unit, surveyed through range-wide monitoring, was approximately 7.5 adults per square mile. Because the sampling occurred in areas that are considered to provide the best habitat and support the highest densities of desert tortoises (i.e., the desert wildlife management area), densities outside of these sampled areas are likely lower.

We also estimated that human activities have degraded approximately 850 square miles of desert tortoise habitat within the recovery unit; therefore, we did not include these areas in our estimate of the number of desert tortoises in the recovery unit. Based on our estimate of less disturbed desert tortoise habitat (5,600 square miles) and the average density that the Service has estimated for surveyed areas of this recovery unit (7.5 desert tortoises per square mile), we estimate that the Northeastern Mojave Recovery Unit supports approximately 42,000 adult desert tortoises. Because desert tortoises outside of the areas sampled through range-wide monitoring likely occur at lower densities, we have likely overestimated the true population size. Regardless of the actual population size of the recovery unit, we anticipate that loss of reproductive adult individuals due to project development, as detailed above, would result in the loss of a small portion of the total population size and reproductive potential within this recovery unit.

We currently do not have population survey data of a sufficient sampling intensity or duration to document a stable or increasing trend across the Northeastern Mojave Recovery Unit. In the Status of the Species section, we discussed habitat loss and degradation and documented declines in the number of desert tortoises in some local populations of this recovery unit. Given this information, desert tortoise populations are unlikely to be increasing in size in this recovery unit. Consequently, we anticipate that the population in this recovery unit is either stable or declining. Given the small percentage of the population of reproductive adults that this project would affect, the proposed action is unlikely to affect substantially the ability of the desert tortoise to reach stable or increasing population trends in the future.

We anticipate that the habitat loss associated with this project will not substantially add to the potential for loss of connectivity between the southern and northern ends of Ivanpah Valley. However, we anticipate that development of ISEGS is likely to exacerbate the effects associated with small population size for the nearly isolated population on the west side of Interstate 15. We anticipate that the Bureau's demographic monitoring program and adaptive management strategy, proposed for this population and the delayed translocation of individuals from the project site will reduce these effects to some degree. In addition, they will provide valuable information regarding the level of connectivity that this population has with other populations in the region.

The compensation required by the Bureau would likely offset some adverse effects of the proposed solar power facility. Compensation actions that would be undertaken are consistent with recommendations for recovery of the desert tortoise. However, the lack of specificity with regard to which actions will be implemented, the uncertainty of success of the actions, and the time lag between implementation of the conservation actions and a substantive effect on recovery of the desert tortoise prohibit us from fully analyzing its potential beneficial effects. Because of the long term or permanent loss of approximately 3,322 acres of desert tortoise habitat, the project will result in a net decrease in desert tortoise habitat.

We do not believe the proposed action would inhibit recovery potential of the desert tortoise, primarily because the ISEGS project is not located in an area that is considered crucial to the recovery of the desert tortoise (i.e., critical habitat unit, desert wildlife management area, or other conservation area for the desert tortoise). The effects of the proposed action may hinder connectivity between desert tortoises in the Ivanpah Valley and Eldorado Valley to some degree. Because of natural and anthropogenic features in the landscape, these connections are constrained, even without the proposed action. The Bureau's proposal to initiate a long-term study with regard to connectivity in this area is likely to inform the Bureau and Service if issues with regard to genetic exchange and demography arise between the action area and adjacent habitat that supports desert tortoises.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Bureau and the National Park Service manage the majority of the land in the action area. We are not aware of any proposed, non-federal actions within the action area.

CONCLUSION

After reviewing its status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise. We have reached this conclusion because:

1. Project activities are likely to kill few desert tortoises of reproductive age because BrightSource will fence work areas to prevent entry by desert tortoises, remove animals from these areas, and use qualified biologists, among other measures to protect desert tortoises.

2. Loss of individuals of smaller size classes is likely to cause some effects to the overall population trend in a localized region of Ivanpah Valley but it is unlikely to affect substantially the trajectory of population trends within the recovery unit or range wide.

3. Delayed translocation of individuals of smaller size classes is likely to offset, to some degree, the adverse effects associated with the direct loss of pre-reproductive individuals on the project site, by increasing the likelihood of population recruitment for the individuals that are cleared from the project site.

4. The number of desert tortoises injured and killed as a result of translocation will likely be small relative to the number of desert tortoises that occur within the Northeastern Mojave Recovery Unit and across the range of the species.

5. BrightSource will implement numerous measures to reduce the potential for increased predation by common ravens and spread of non-native plant species.

6. Compensation requirements through the Bureau and California Energy Commission may result in an increase in the amount of existing habitat that is managed for the conservation of the desert tortoise and will likely lead to restoration of lost or degraded habitat within these areas.

7. Regional management actions are likely to aid in reducing common raven predation in a portion of the desert tortoise's range.

8. Under current conditions, population connectivity can be maintained through the habitat linkages that would remain between the existing developments in Ivanpah Valley.

As we noted previously in this biological opinion, the analysis we conduct under section 7(a)(2) of the Endangered Species Act must be conducted in relation to the status of the entire listed taxon. We based the analysis in this biological opinion within the context of the Northeastern Mojave Recovery Unit because of the wide range of the desert tortoises. We have determined that the effects of this action would not compromise the integrity of the Northeastern Mojave Recovery Unit or impede the survival and recovery of the desert tortoise in an appreciable manner in this portion of its range, and therefore, by extension, conclude that the action is not likely to cause any appreciable reduction in the likelihood of both the survival and recovery of the Mojave population of the desert tortoise.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of an incidental take statement.

The measures described in this document are non-discretionary. The Bureau has a continuing duty to regulate the activities covered by the incidental take statement in the biological opinion. If the Bureau fails to include the terms and conditions of this incidental take statement as enforceable conditions of its right-of-way grant, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Bureau must report the progress of its action and its impact on the desert tortoise to the Service as specified in the incidental take statement [50 *Code of Federal Regulations* 402.14(i)(3)].

The proposed action will result in the take of all desert tortoises in the project area (i.e., Units 1, 2, and 3 and the CLA of ISEGS, along the fiber optic line, gas transmission line, access road, and in areas where exclusion fencing would be installed). The proposed action will also result in the take of numerous desert tortoises (i.e., resident and control animals) in the recipient and control sites. The following paragraphs define the form of take and the number of individuals we anticipate the proposed action will take. In the 2010 Biological Opinion, we included a table summarizing the levels of take that necessitated re-initiation of formal consultation. We have not included such a table in this biological opinion. In the remainder of the incidental take statement, the quantified capture, injury, and mortality take described for various aspects of the project is presented as a range of individuals. In our Effects of the Action section, we fully analyzed each range identified below. Therefore, the amount or extent of the taking specified in this incidental take statement is exceeded if the higher number in any of the identified ranges is exceeded.

For the anticipated take in the form of injury or mortality resulting from construction of the ISEGS facilities, we would consider the amount or extent of that taking to be exceeded if the number of individuals captured on the ISEGS project site and its perimeter fence lines exceeds 289 individuals. We would do so because the Bureau will not be able to measure compliance with the anticipated injury and mortality take identified below for the construction of the ISEGS facility (i.e., 405 to 1136 individuals). This is because virtually all of the individuals missed during clearance surveys and killed during construction will be smaller sized class individuals, and BrightSource or the Bureau are unlikely to locate the carcasses of many of these individuals. The inability to locate these carcasses will make it impossible for the Bureau to measure its compliance with this portion of the take statement by directly identifying dead individuals on the project site. To address this issue we have used the threshold for capture of individuals on the ISEGS project site as a surrogate measure of mortality. This will provide an appropriate surrogate for measurement of compliance of the estimate of the number of individuals that may be killed on the ISEGS project site during construction is related to our estimation of the number of desert tortoises (including the proportion of the population of smaller sized individuals) that clearance surveys are likely to find. Consequently, finding more than 289 individuals would indicate that a larger number of smaller individuals may be killed during construction. Because clearance surveys would occur prior to commencement of construction activities, use of this trigger would allow re-initiation of consultation and a reassessment of the estimated mortality take prior to any mortality occurring. Because we

estimate below that few if any desert tortoises, larger than 160 millimeter, would be killed, terms and conditions 2.b. and 2.c. set additional thresholds for re-initiation of consultation related to take, in the form of injury or death, of desert tortoises larger than 160 millimeters.

Clearance, Quarantine, Translocation, and Post-translocation Monitoring of Desert Tortoises from the ISEGS Project Site

Including the individuals captured from Unit 1 and the CLA under the 2010 biological opinion, we anticipate that clearance surveys, health assessments, blood testing, quarantine, translocation, and post-translocation monitoring of individuals from the ISEGS project site and its perimeter fence lines will involve the take, in the form of capture and harassment, of between 128 and 289 individuals (includes all size classes). Harassment of these individuals would be due to the need to collect blood and perform health assessments. Of the individuals captured and harassed on the project site, we anticipate that each individual would be captured and handled multiple times during the quarantine and post-translocation monitoring period to facilitate health assessments, transmitter replacement, and other activities associated with post-translocation monitoring and quarantine.

We anticipate that the proposed action will take, in the form of mortality, between 23 and 43 individuals during the 5-year quarantine. We anticipate that few if any of the additional captured individuals would die or be injured due to inappropriate handling during clearance surveys, health assessments, blood testing, quarantine, translocation, and post-translocation monitoring. Over the 10-year post-translocation monitoring period, we anticipate mortality of some individuals in the translocated population, but we do not anticipate that this mortality will be significantly different from that experienced by other populations in the region that are not affected by translocation. However, we anticipate the mortality of some desert tortoises from field workers assessing translocation areas. Because the frequency of monitoring would be spread out over time and field workers would be experienced biologists, we anticipate that these activities would result in the injury and mortality of few if any desert tortoises.

In addition to the individuals captured on the project site and its perimeter fence lines, we anticipate the capture of desert tortoises on other linear facilities associated with the project (i.e., translocation site fencing, access road fencing, fiber-optic line, gas line, etc.). We cannot precisely predict the number of individuals that BrightSource would move out of harm's way along linear facilities, but we anticipate that the number would be small given the small area that these activities would affect.

Post-translocation Monitoring of Desert Tortoises that are Resident to the Recipient and Control Sites

We anticipate the take, in the form of capture and harassment (due to blood collection and health assessment), of between 206 and 492 desert tortoises in the resident and control population to facilitate post-translocation monitoring. We anticipate that each of these

individuals would be re-captured multiple times during the post-translocation monitoring period to facilitate health assessments, transmitter replacement, and other activities associated with post-translocation monitoring. We anticipate that few if any individuals would be killed or injured due to inappropriate handling during the post-translocation monitoring period. We anticipate that some level of mortality would occur in the resident and control populations over the post-translocation monitoring period, but we anticipate that few if any would be killed or injured by translocation activities.

Construction of the ISEGS Facilities

We anticipate that construction of the ISEGS project site is likely to take, in the form of mortality or injury, between 405 and 1136 desert tortoises due to direct effects of construction or due to loss of 3,444 acres of habitat. This total estimate includes mortality reported under the 2010 biological opinion (i.e., 2 desert tortoises found dead) and additional mortality estimated through our analysis in this biological opinion for all units of the project. We anticipate that the vast majority of these will be individuals of smaller size or desert tortoise eggs that are difficult to detect during clearance surveys and construction monitoring; therefore, we are unlikely to find carcasses of these individuals. Therefore, at the beginning of the incidental take statement we provided a surrogate measure to ensure that the Bureau can monitor compliance with this take threshold. We anticipate that few, if any, of the animals injured, killed, or harmed would be larger than 160 millimeters. Because we cannot predict the time of year when activities would occur, we cannot predict whether project activities would affect hatchlings or eggs. Consequently, eggs have been combined with desert tortoises in this take statement in contrast to how we addressed eggs in the 2010 biological opinion.

We anticipate that the installation of desert tortoise exclusion fencing for the access route, translocation area, and project site has eliminated and will continue to eliminate portions of the home ranges of some desert tortoises. To the extent that desert tortoises with divided home ranges exhibit behavior that would result in injury or death, this would constitute take in the form of harm. We cannot quantify the take associated with this habitat loss with any certainty because we have no information on home range configurations for individuals affected by the project, including the fences.

Compensation

All enhancement actions associated with the Bureau's compensation requirements will require future Bureau authorizations. Consequently, we have not provided incidental take exemptions for these actions in this biological opinion. These actions will require future project-specific consultation if they may affect the desert tortoise or other listed species.

Operation and Maintenance of ISEGS Facilities

We anticipate that operation and maintenance activities, including site access, within

permanently fenced areas are likely to take few desert tortoises. A limited potential exists that a very small number of desert tortoises may find their way into a fenced area. Most of these individuals are likely to be taken in the form of capture as they are removed to offsite habitat; a small fraction of these individuals may be taken, in the form of injury or mortality, if they are exposed to adverse weather conditions or crushed by vehicles before they are detected.

We anticipate that Class I maintenance activities that are outside of fenced work areas and Class II maintenance activities associated with fence repair are likely to take, in the form of injury or mortality, few, if any, desert tortoises because Class I activities would not result in ground disturbance, Class II activities would be localized and infrequent, and access to repair sites would require little, if any, off-road travel. In addition, for all maintenance work, BrightSource would implement numerous protective measures to avoid killing or injuring desert tortoises. We anticipate that these maintenance activities may result in the take, in the form of capture, of a small number of desert tortoises if they are encountered during work activities and moved from harm's way.

Because we do not have sufficient information regarding the location or extent of other Class II and Class III maintenance activities that may occur outside of the permanently fenced work areas, we cannot determine the level of take associated with these activities. Consequently, we cannot provide an exemption from the prohibitions against take for these activities. These actions will require further site-specific or programmatic consultation.

Decommissioning and Restoration of ISEGS Facilities

We anticipate that restoration of temporary disturbance within fenced facilities during operation and maintenance or following decommissioning is unlikely to result in take of desert tortoises because BrightSource will clear all fenced areas of desert tortoises prior to construction of facilities. After facility closure, decommissioning activities and restoration of long-term disturbance within fenced areas are unlikely to take desert tortoises for the same reason. We anticipate that restoration of temporary disturbances and long-term disturbances outside of fenced work areas is likely to take, in the form of injury or mortality, few, if any, desert tortoises for the following reasons. We anticipate that a few desert tortoises are likely to be taken, in the form of capture, as they are moved out of harm's way, during these activities. Because much of this work would occur many years from now, we cannot quantify the number of animals that are likely to be taken in this manner. However, we do not anticipate that moving desert tortoises a short distance out of harm's way will result in any meaningful adverse effects to the individuals.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of desert tortoises during the implementation of the ISEGS project:

1. The Bureau must ensure that desert tortoises do not enter fenced project facilities.

2. The Bureau must ensure that the level of incidental take associated with the ISEGS project is commensurate with the analysis contained herein.

3. The Bureau must ensure that the rate of mortality or injury of translocated and resident desert tortoises is not elevated above the rate of mortality or injury for other populations within the action area that are not affected by translocation.

4. The Bureau must ensure that the ISEGS facility does not serve as an attractant to common ravens.

5. The Bureau must ensure that desert tortoises that exhibit clinical signs of disease are not translocated.

6. The Bureau must ensure the proper implementation of health assessments and disease testing to ensure the accuracy of results and to minimize the injury of desert tortoises.

Our evaluation of the proposed action includes consideration of the protective measures described in the Description of the Proposed Action section of this biological opinion. Consequently, any changes in these protective measures may constitute a modification of the proposed action that causes an effect to the desert tortoise that was not considered in the biological opinion and require re-initiation of consultation, pursuant to the implementing regulations of the section 7(a)(2) of the Act (50 Code of Federal Regulations 402.16).

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with the following terms and conditions, which implement the reasonable and prudent measures described in the previous section, or make them enforceable conditions of its right-of-way grant, and must comply with the reporting and monitoring requirements. These conditions are non-discretionary.

1. The following term and condition implements reasonable and prudent measure 1:

   The Bureau must ensure that BrightSource monitors the integrity of all desert tortoise exclusion fencing at least once a month and following any rain events that result in surface flow of water in washes or sheet flow within the action area. The Bureau must ensure that BrightSource repairs damage immediately after it is identified during monitoring.

2. The following terms and conditions implement reasonable and prudent measure 2:

a. To ensure that the measures proposed by the Bureau and BrightSource are effective and are being properly implemented, the Bureau must contact the Service immediately if it becomes aware that a desert tortoise has been killed or injured by project activities. At that time, the Service and the Bureau must review the circumstances surrounding the incident to determine whether additional protective measures are required. Project activities may continue pending the outcome of the review, provided that the proposed protective measures and any appropriate terms and conditions of this biological opinion have been and continue to be fully implemented.

b. If 9 desert tortoises, larger than 160 millimeters, are killed or injured as a result of any construction, operation, maintenance, decommissioning, or restoration activities covered by this biological opinion over the life of the ISEGS project, the Bureau must request reinitiation of consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action. This term and condition also applies to direct mortality and injury of desert tortoises during translocation and post-translocation monitoring on the resident, control, and translocated populations (i.e., due to handling, road kills, or other effects caused by personnel working on the project). However, it does not apply to post-translocation mortality within these populations that is not connected directly to an action required to carry out the translocation and monitoring effort.

c. If 3 desert tortoises, larger than 160 millimeters, are killed or injured in any 12-month period as a result of any construction, operation, maintenance, decommissioning, or restoration activities covered by this biological opinion, the Bureau must request reinitiation of consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action. This term and condition also applies to direct mortality and injury of desert tortoises during translocation and post-translocation monitoring on the resident, control, and translocated populations (i.e., due to handling, road kills caused by personnel working on the project). However, it does not apply to post-translocation mortality within these populations that is not connected directly to an action required to carry out the translocation and monitoring effort.

The thresholds identified above apply to activities occurring under this biological opinion and not to activities that occurred under the 2010 biological opinion.

3. The following term and condition implements reasonable and prudent measure 3:

   If monitoring of translocated and resident desert tortoises indicates a statistically significant elevation in mortality rates above that observed in the control population, the Bureau must request reinitiation of consultation, pursuant to the implementing

regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action.

4. The following term and condition implements reasonable and prudent measure 4:

   The Bureau must meet with the Service to review data and reports associated with BrightSource's monitoring and adaptive management program for common ravens prior to the cessation of these activities. If the agencies mutually determine that further monitoring and adaptive management are warranted, the Bureau must require BrightSource to extend these activities until such time that the agencies determine they are no longer needed. If, at any time during operation or decommissioning of the ISEGS facility, the agencies determine that the monitoring of and adaptive management program for common ravens needs to be re-instated, the Bureau must ensure that BrightSource resumes this activity.

5. The following term and condition implements reasonable and prudent measure 5:

   After performance of visual health assessments on project-site desert tortoises, the Bureau must ensure that the Service receives the results of the health assessments and the proposed disposition of each individual within 14 days prior to release into recipient sites. The Bureau must ensure that BrightSource receives authorization for translocation of these individuals from the Service prior to commencement of translocation.

6. The following term and condition implements reasonable and prudent measure 6:

   The Bureau must ensure that all individuals who intend to perform visual health assessments and blood collection have been specifically authorized or trained for that activity by the Service. The Bureau must provide the credentials for all individuals seeking approval to conduct these activities to the Service at least 30 days prior to the need for visual health assessments and blood collection.

7. The following term and conditions implement reasonable and prudent measure 7:

   If the proposed recipient sites are not large enough to accommodate all of the desert tortoises without violating the density threshold defined in the project description, the Bureau must request reinitiation of consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16 to address modifications to the translocation plan.

REPORTING REQUIREMENTS

Within 60 days of the completion of the proposed action, the Bureau must provide a report to the Service that provides details on the effects of the action on the desert tortoise. The Bureau

must also provide monthly reports to the Service during construction of each unit and during the subsequent translocation monitoring. Specifically, these reports must include information on the effectiveness and practicality of minimization measures (i.e., examples of flaws and recommendations for improvement in certain measures), any instances when desert tortoises were killed, injured, captured, or handled; the circumstances of such incidents and the specific information for each animal; and any actions undertaken to prevent similar instances from re-occurring. In addition, these reports should provide detailed information on the translocation effort and results of translocation monitoring to include the following: 1) location of all desert tortoises carrying transmitters, 2) mortality rate from each population, 3) statistical analysis of mortality rate between all three populations, 4) health status and body condition of all desert tortoises that carry transmitters, 5) status of animals captured and moved, and 6) release location and date for each translocated animal. These reports should also provide an estimate of the actual acreage disturbed by various aspects of the construction and operation up to the time of the report.

We recommend that the Bureau provide us with any recommendations that would facilitate the implementation of the protective measures while maintaining protection of the desert tortoise. We also request that the Bureau provide us with the names of any monitors who assisted the authorized biologist and an evaluation of the experience they gained on the project; the qualifications form on our website (http://www.fws.gov/ventura/sppinfo/protocols/deserttortoise_monitor-qualifications-statement.pdf), filled out for this project, along with any appropriate narrative would provide an appropriate level of information. This information would provide us with additional reference material in the event these individuals are submitted as potential authorized biologists for future projects.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the Bureau work with BrightSource and the Service to determine if the desert tortoises associated with the resident, control, and translocated populations can be used to answer additional research questions related to translocation or desert tortoise biology.

2. We recommend that the Bureau amend the necessary land use plans to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within all remaining portions of the Ivanpah Valley to reduce fragmentation within the critical

linkage between the Ivanpah Critical Habitat Unit and the Eldorado Critical Habitat Unit.

3. We recommend that the Bureau perform additional wild burro gathers in the former Clark Mountain Herd Management Area to remove remaining burros that may adversely affect habitat within translocation areas.

4. Based upon our review, certain aspects of the weed management plan may result in an inefficient use of resources. We recommend that the Bureau and BrightSource work with the Mojave Resource Conservation District to develop a site-specific weed management plan that would be effective and efficient.

5. We recommend that the Bureau consider alternative configurations for this project and the First Solar-Silver State Project that would focus ground disturbance on lands closer to Ivanpah Lake that are likely to have fewer desert tortoises and are less crucial to population connectivity.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

Within 3 days of locating any dead or injured desert tortoises, you must notify the Ventura Fish and Wildlife Office by telephone (805 644-1766) and by facsimile (805 644-3958) or electronic mail. The report must include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

We will advise you on the appropriate means of disposing of the carcass when you contact us. We may advise you to provide it to a laboratory for analysis. Until we provide information on the disposition of the carcass, you must handle it such that the biological material is preserved in the best possible state for later analysis. If possible, the carcass should be kept on ice or refrigerated (not frozen) until we provide further direction.

Injured desert tortoises must be taken to a qualified veterinarian for treatment. If any injured desert tortoises survive, the Service must be contacted regarding their final disposition.

RE-INITIATION NOTICE

This concludes formal consultation on the Bureau's proposal to issue a right-of-way grant to BrightSource for construction of the ISEGS facility in San Bernardino County, California. Re-initiation of formal consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of

taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 Code of Federal Regulations 402.16).

If you have any questions regarding this biological opinion, please contact the U.S. Fish and Wildlife Service at (909) 382-2677.

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Eldorado-Ivanpah Transmission Project

7460 (1) Permit and Notice of Proposed Construction

Federal Aviation Administration - Ivanpah

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76137

Aeronautical Study No.
2011-AWP-5491-OE

Issued Date: 09/28/2011

FCC Licenses
Southern California Edison Company
GO3, 2nd Floor, MD9, 2131 Walnut Grove Avenue
Rosemead, CA 91770

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower Ivanpah Substation
Location:	Nipton, CA
Latitude:	35-32-41.60N NAD 83
Longitude:	115-28-11.60W
Heights:	180 feet above ground level (AGL)
	3219 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

As a result of this structure being critical to flight safety, it is required that the FAA be kept appraised as to the status of the project. Failure to respond to periodic FAA inquiries could invalidate this determination.

This aeronautical study included evaluation of a structure that exists at this time. Action will be taken to ensure aeronautical charts are updated to reflect the most current coordinates, elevation and height as indicated in the case description.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 03/28/2013 unless:

(a) extended, revised or terminated by the issuing office.

(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (817) 838-1993. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2011-AWP-5491-OE.

Signature Control No: 149525464-150240452 (DNE)
Joan Tengowski
Technician

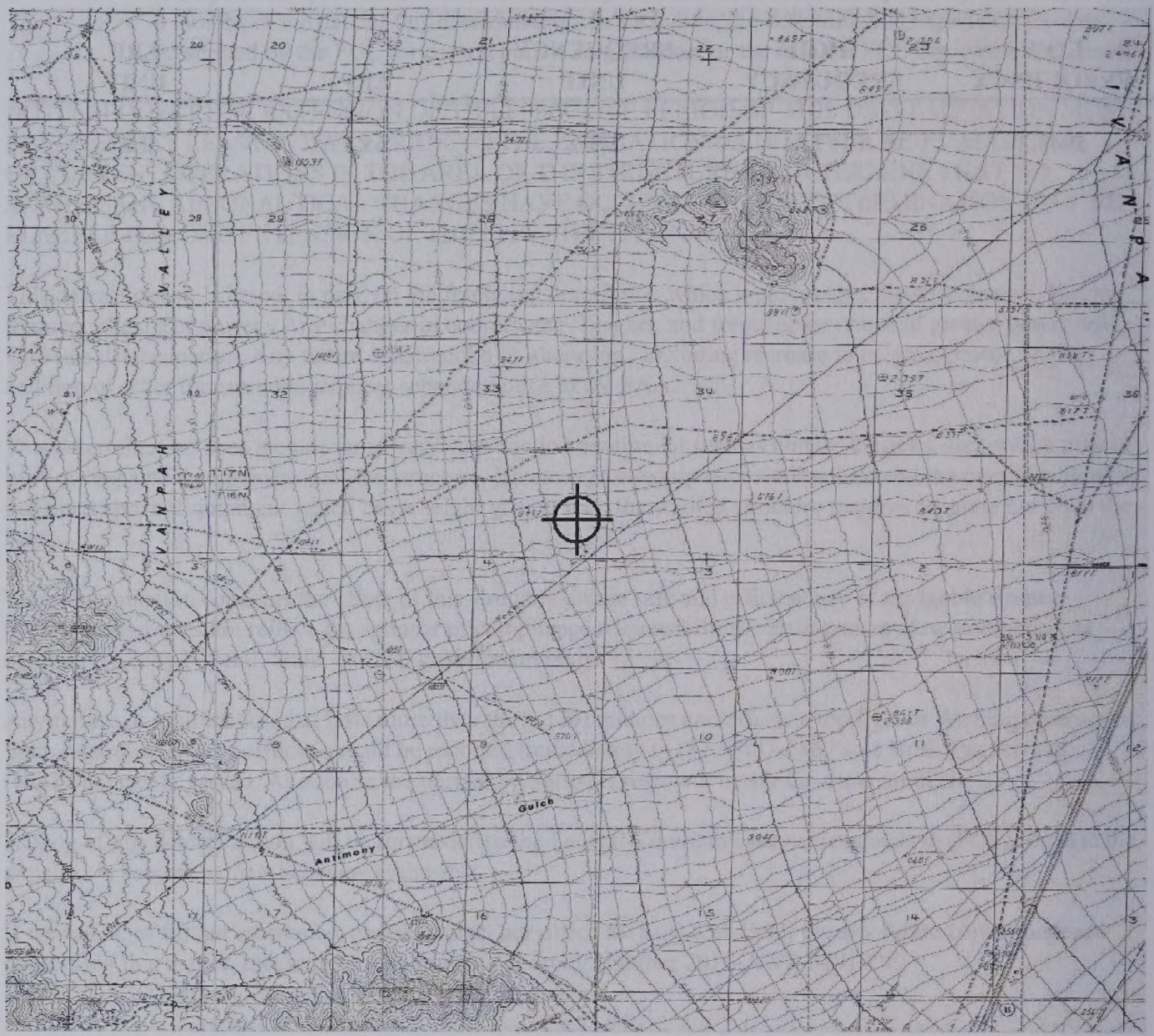
Attachment(s)
Frequency Data
Map(s)

cc: FCC

Frequency Data for ASN 2011-AWP-5491-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
5945.2	6197.24	MHz	65.5	dBm

TOPO Map for ASN 2011-AWP-5491-OE



Eldorado-Ivanpah Transmission Project

7460 (1) Permit and Notice of Proposed Construction

Federal Aviation Administration - Nipton

Anticipated Submittal Date: 12/30/2011

Eldorado-Ivanpah Transmission Project

Licenses Federal Communications Commission

Tower

Anticipated Submittal Date: 10/31/2011

Eldorado-Ivanpah Transmission Project

Appendix B2 – California State Permits

Certificate of Public Convenience and Necessity (CPCN)

Incidental Take Permit – 2081

Streambed Alteration

401 Certification - California Division of Water Resources

Eldorado-Ivanpah Transmission Project

Certificate of Public Convenience and Necessity

COM/MP1/gd2

Date of Issuance 12/27/2010

Decision 10-12-052 December 16, 2010

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of the Southern California Edison Company (U 338 E) for a Certificate of Public Convenience and Necessity for the Eldorado-Ivanpah Transmission Project.	Application 09-05-027 (Filed May 28, 2009)

DECISION GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE ELDORADO-IVANPAH TRANSMISSION PROJECT

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DECISION GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE ELDORADO-IVANPAH TRANSMISSION PROJECT

1. Summary

This decision grants Southern California Edison Company (SCE) a certificate of public convenience and necessity (CPCN) for the Eldorado-Ivanpah Transmission Project, using the Environmentally Preferred Route, as identified in the Final Environmental Impact Report. This route corresponds to the project as proposed by the Applicant.[1] The Eldorado-Ivanpah Transmission Project is to be located in San Bernardino County, California and Clark County, Nevada. The Commission's permitting review for a CPCN for a transmission project by an investor owned utility involves two concurrent processes: (1) a Commission proceeding assessing the project's public interest and cost pursuant to Public Utilities Code § 1001 et seq. and (2) an environmental review pursuant to California Environmental Quality Act (CEQA), Public Resources Code §§ 21000, et seq.

As the Lead Agency in the State of California for the environmental review of the project, the Commission finds the Joint Environmental Impact Report/Environmental Impact Statement prepared by the Commission and the United States Bureau of Land Management for this project meets the requirements of the CEQA, Public Resources Code §§ 21000, et seq. The Commission also finds overriding considerations that merit construction of the project notwithstanding its significant and unavoidable environmental impacts, as detailed in the environmental report. Accordingly, the Commission certifies

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[1] Joint FEIR/EIS at 4-7.

the final environmental report in accordance with CEQA Guidelines § 15090. A copy of the final document can be found on the Commission's website at http://www.cpuc.ca.gov/Environment/info/ene/ivanpah/Ivanpah.htm.

We also find that the Applicant has met its burden of proof and that the project is "necessary to facilitate" achievement of the renewable power goals of § 399.11 *et seq.* pursuant to Public Utilities Code § 399.2.5. Consistent with this, we find that the project is eligible for back-stop cost recovery. The role this line will play in achieving the state's 20 percent renewable mandate and our greenhouse gas mitigation goals under Assembly Bill 32[2] serve as the basis for a finding of overriding considerations, recognizing that the Final Joint Environmental Impact Report/Environmental Impact Study (EIR/EIS) determined that the project will have several significant and non-mitigable impacts.[3]

SCE's estimated costs for the proposed construction are approximately $306 million plus contingency and other related expenses. We find that the cost of the line, subject to a reduction in the proposed contingency amount is reasonable. A cost cap is adopted in accordance with Pub. Util. Code § 1005.5 in the amount of $306.338 million plus a 15% contingency.

In addition, pursuant to General Order 131-D and Decision 06-01-042, the Commission certifies that this project is in compliance with the Commission's policies governing the mitigation of electromagnetic field effects using low-cost and no-cost measures.

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[2] Stats. 2006, ch. 488.

[3] Joint FEIR/EIS at 6-3.

Accordingly, the Commission approves the Applicant's request for a certificate of public convenience and necessity.

This proceeding is closed.

2. Background

Southern California Edison Company (SCE or Applicant) is an investor-owned public utility operating an interconnected and integrated electric utility system that generates, transmits, and distributes electric energy in portions of Central and Southern California.[4] In addition to its California properties, SCE separately or jointly owns facilities in Nevada, Arizona, and New Mexico that produce power and energy for use in California.

2.1. The Eldorado-Ivanpah Transmission Project

SCE is proposing to construct the Eldorado-Ivanpah Transmission Project in order to access renewable generation near the southern California-Nevada border.[5] The Eldorado-Ivanpah Transmission Project would primarily consist of (1) the construction of a new 220/115 kV substation, the Ivanpah Substation, in San Bernardino County to serve as a collector hub for solar generation projects identified in the Eastern Mojave Desert Area, know as the Ivanpah Dry Lake

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[4] SCE's service territory is located in 15 counties in Central and Southern California, consisting of Fresno, Imperial, Inyo, Kern, Kings, Los Angeles, Madera, Mono, Orange, Riverside, San Bernardino, Santa Barbara, Tulare, Tuolumne, and Ventura Counties, and includes approximately 179 incorporated communities and outlying rural territories. SCE also supplies electricity to certain customers for resale under tariffs filed with the Federal Energy Regulatory Commission.

[5] SCE Application at 1.

Area;[6] (2) removal of 35 miles of an existing 115 kilovolt (kV) transmission line between the new Ivanpah Substation and the existing Eldorado Substation, located near Boulder City, Nevada, and the construction of a double-circuit 220 kV line (28 miles in Nevada and seven miles in California) within expanded rights-of-way, and (3) construction of two separate telecommunication routes (Path 1 and Path 2) to support redundant telecommunications for a Special Protection System (SPS).[7]

The project is intended to provide the electrical facilities necessary to integrate up to 1,400 megawatts (MW) of new renewable generation from the Ivanpah Dry Lake Area[8] and will be configured to allow for future network upgrades to further increase renewable resource integration beyond 1,400 MW.[9] SCE states this project is needed to integrate renewable generation so that it and other utilities meet their goal of 20% by 2010 and 33% by 2020.

Land uses within the area range from open space and conservation/ preserve areas to commercial, public, private, and recreation; utility/energy uses; industrial and mining uses; transportation; and limited residential uses.[10] Lands in the area with special designations include the Mojave National Preserve,

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[6] The phrase "Ivanpah Dry Lake Area" is used repeatedly throughout documents filed by Applicant and within the Joint EIR/EIS. The exact definition of this area is not specified. August 9, 2010 RT 37:16-28; 41:2-7; 54:16-20.

[7] SCE Application at 1-2.

[8] SCE Opening Brief at 8.

[9] SCE PEA at 1.4.

[10] Joint Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) at 3.9-1.

wilderness areas (Wee Thump, Joshua Tree, and South McCullough), and Areas of Critical Environmental Concern (ACECs).[11] The project would be located on lands primarily managed by the U.S. Department of the Interior, Bureau of Land Management (BLM).

2.2. Procedural History

This proceeding commenced on May 28, 2009 when SCE filed Application (A.) 09-05-027, a request for a certificate of public convenience and necessity (CPCN) to construct the Eldorado-Ivanpah Transmission Project.[12] The Commission's permitting review for a transmission CPCN involves two concurrent processes: (1) a Commission proceeding assessing the project's public interest and cost pursuant to Public Utilities Code 1001 et seq. and (2) an environmental review pursuant to California Environmental Quality Act (CEQA), Public Resources Code §§ 21000, et seq. Consistent with CEQA, SCE's Application included a Proponent's Environmental Assessment (PEA), the document presenting the Applicant's environmental review of the project.

On June 22, 2009, the assigned Administrative Law Judge (ALJ) issued a ruling directing SCE to amend its Application to include, among other things, the requisite cost information. This ruling was made pursuant to Rule 3.1 of the Commission's Rules of Practice and Procedure and its General Order (GO) 131-D. This ruling also delayed the start of the protest period until the Application was amended and re-served. SCE filed its amendment on

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[11] *Ibid.*

[12] The docket card for A.09-05-027, including documents filed with the Commission, is available at www.cpuc.ca.gov.

September 22, 2009 and its Application was subsequently noticed in the Commission's Daily Calendar on September 25, 2009 (referred to herein as "Application").

The Commission's Division of Ratepayer Advocates (DRA) filed a timely protest to the Application. Brightsource Energy, Inc. (Brightsource), the parent corporation of several renewable generation developers in the Ivanpah Dry Lake Area, filed a timely response in support of SCE's Application. On December 2, 2009, the assigned ALJ held a prehearing conference at the Commission in San Francisco, California. Several months later, on July 14, 2009, the assigned Commissioner issued a scoping memo, as required by statute,[13] which set forth the following issues to be addressed in the proceeding:

1. Does the project serve a present or future convenience and necessity, and meet the requirements set forth in Pub. Util. Code § 399.2.5 and § 1001 et seq.? If so, which project or alternative most effectively or feasibly meets that need?

2. What are the significant environmental impacts of the proposed project?

3. Are there potentially feasible mitigation measures that will eliminate or lessen the significant environmental impacts?

4. As between the proposed project and the project alternatives, which is environmentally superior?

5. Are the mitigation measures or project alternatives infeasible? (CEQA Guideline 15091(a)(3).) This issue includes consideration of

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[13] *Joint Assigned Commissioner and Administrative Law Judge's Scoping Memo Ruling* (Scoping Memo), December 21, 2009.

the proposed and alternative projects' impact on community values pursuant to Pub. Util. Code § 1002(a)(1).

6. To the extent that the proposed project and/or project alternatives result in significant and unavoidable impacts, are there overriding considerations pursuant to CEQA Guidelines § 15093 that merit approval of the proposed project or a project alternative?

7. Were the environmental documents completed in compliance with CEQA, did the Commission review and consider the FEIR prior to approving the project or a project alternative and does the FEIR reflect the Commission's independent judgment? (CEQA Guideline § 15090.)

8. Is the proposed project and/or project alternative designed in compliance with the Commission's policies governing the mitigation of EMF effects using low-cost and no-cost measures? (GO 131-D, Part X.)

9. If a certificate is granted, what is the maximum cost of the approved project? (Pub. Util. Code § 1005.5(a).)

10. Is coordination required with the Nevada Public Utilities Commission? If so, what coordination must take place?

Consistent with the determination in the Scoping Memo, evidentiary hearings were held for several days in August 2010. A few weeks prior to those hearings, Center for Biological Diversity filed a *Motion to Reconsider and Amend Joint assigned Commissioner and Administrative Law Judge's Scoping Memo Ruling* (dated July 16, 2010). SCE and Brightsource filed timely responses in opposition to the Center for Biological Diversity's motion. A reply was then filed by Center for Biological Diversity. The motion sought permission to present testimony at

hearings on environmental issues that "have not been adequately addressed in the Draft Environmental Impact Report."[14] In support of its request, the Center for Biological Diversity cited to *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1201. In opposing the request by the Center for Biological Diversity, SCE relied on the language of the Scoping Memo.[15] "[Environmental] issues are within the scope of the CEQA review and should be pursued within that environmental review process. No evidentiary hearings or further evidence is needed on these issues."[16] Both SCE and Brightsource offered supplementary testimony in response to the testimony attached to the motion by Center for Biological Diversity. The assigned ALJ, after hearing arguments on the merits of the motion and the responses in opposition, denied the Center for Biological Diversity's motion.[17] We affirm this ALJ's ruling and all other rulings made in this proceeding.[18]

SCE's filing of its CPCN Application also started the required environmental review of the Applicant's request. The environmental review takes place under CEQA. The CEQA review is a concurrent and mostly separate

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[14] Center for Biological Diversity July 16, 2010 motion at 1.

[15] SCE July 21, 2010 response to motion at 4.

[16] SCE July 21, 2010 response to motion at 4.

[17] August 9, 2010 RT 10:5-13.

[18] In this ruling, the assigned ALJ did not enter the testimony offered by Center for Biological Diversity, Brightsource, and SCE into the evidentiary record but preserved it in the file for purposes of potential appeal. This testimony was not subject to cross-examination. Some parties cite these materials in their formal filings, such as opening and reply briefs, in this proceeding. All references to this testimony in opening or reply briefs will be given no evidentiary weight.

analysis from Public Utilities Code § 1001 et seq. In this instance and because the proposed construction would take place on federal lands, the Commission agreed to conduct its environmental review jointly with the federal lead agency, BLM, under National Environmental Policy Act of 1969, as amended (NEPA).[19]

The joint NEPA and CEQA scoping process[20] commenced, respectively, on July 27, 2009 with BLM's publication in the Federal Register of a Notice of Intent to prepare an Environmental Impact Statement (EIS) and on July 24, 2009 with the Commission's issuance of a Notice of Preparation of an Environmental Impact Report (EIR).[21]

BLM and the Commission, together with their environmental consultants,[22] prepared for and jointly held two scoping meetings, on July 28, 2009 in Nipton, California, which is located along the proposed route and on the boundary of the Mohave National Preserve,[23] and on July 29, 2009 in Las Vegas, Nevada.[24] The scoping process, including the related meetings, is intended to ensure that significant public issues, alternatives, and impacts are addressed in environmental documents. The scoping process also determines

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[19] Joint FEIR/EIS at 1-1.

[20] Joint FEIR/EIS at 7-1. Scoping is required by CEQA for project of "statewide, regional or area-wide significant" per § 21083 of the Public Resources Code and similar federal law.

[21] Joint FEIR/EIS at 7-2.

[22] The Commission and BLM prepared, via their third-party consultant, Ecology and Environment, Inc. a joint EIR/EIS.

[23] Joint FEIR/EIS, Appendix E at 3.

[24] Joint FEIR/EIS at 7-2.

the scope and degree to which these issues raised by the public, alternatives, and impacts will be analyzed.[25] By the close of the scoping period on August 26, 2009, the Commission and BLM received correspondence from public agencies, organizations and private citizens.[26] No verbal comments were received during the scoping meetings.

As a result of the alternative screening process, the Commission and BLM chose seven of the initial 17 alternatives[27] for detailed analysis in the Joint EIR/EIS.[28] The Joint EIR/EIS at Appendix A summarizes the alternatives presented for review, how alternatives were screened out, and provides a record of the screening methodology[29] with conclusions about alternatives carried forward for full EIR/EIS analysis.[30]

The Commission and BLM published the Draft EIR/EIS on April 30, 2010. Comments to the Draft EIR/EIS were submitted by federal and state agencies, private organizations, and environmental groups on or before the end of the CEQA 45-day comment period, June 21, 2010.[31]

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[25] Joint FEIR/EIS at 7-1. This scoping process is discussed in more detail in the Joint EIR/EIS at chapter 7 and is summarized in Appendix E - *Scoping Summary Report.*

[26] Joint FEIR/EIS, Appendix E at 5-14 and Appendix E at Appendix G (Appendix E contains several Appendices, including "G." These Appendices were not published with the Draft EIR/EIS but included in the Final EIR/EIS.

[27] Joint FEIR/EIS at 2-45.

[28] Joint FEIR/EIS at 7-3.

[29] Joint FEIR/EIS, Appendix A-1 at 1-9 (Sec. 2.1 – Alternative Screening Methodology).

[30] Joint FEIR/EIS, Appendix A at 1-1.

[31] These comments can be found at Appendix G, Final Joint EIR/EIS.

The Commission received opening and reply briefs in A.09-05-027 on August 27, 2010 and September 10, 2010.

The Commission released the Final EIR/EIS on November 5, 2010. Federal publication will occur later.

3. Burden of Proof

SCE must demonstrate a need for the Commission to issue the CPCN.[32] The utility "has the burden of affirmatively establishing the reasonableness of all aspects of its application. Intervenors do not have the burden of proving the unreasonableness of [the utility's] showing."[33] Evidence Code § 115 defines burden of proof as follows:

> "Burden of proof" means the obligation of a party to establish by evidence a requisite degree of belief concerning a fact in the mind of the trier of fact .... The burden of proof may require a party to raise a reasonable doubt concerning the existence or nonexistence of a fact or that he establish the existence or nonexistence of a fact by a preponderance of the evidence, by clear and convincing evidence, or by proof beyond a reasonable doubt.

Except as otherwise provided by law, the burden of proof in this proceeding requires proof by a preponderance of the evidence. The preponderance of the evidence is generally the default standard in civil and administrative law cases.[34] We apply that standard in this decision.

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[32] *Investigation into Methodology for Economic Assessment of Transmission Projects*, D.06-11-018 at 22, "The Commission has long held that the applicant carries the burden of proof in a certification proceeding, and we reiterate those determinations today."

[33] D.06-05-016 at 7.

[34] CA Admin. Hearing Practice, 2d Ed. (2005) at 365.

4. Analysis

4.1. Statutory Framework

Public Utilities Code § 1001 et seq. establishes the framework for the Commission's review of this CPCN Application. Several statutory components exist within this framework. Sections 1001, 1002(a), 1002.3 and 399.2.5 address the public interest and other related factors. Section 1005.5 guides the Commission's evaluation of costs.

4.2. Public Utilities Code §§ 1001 and 1002

Section 1001 mandates that, before the Commission can authorize a CPCN for the Eldorado-Ivanpah Transmission Project, it must find the "present or future public convenience and necessity require or will require its construction."[35] A finding of need is required before the Commission may issue a CPCN. We find that SCE has demonstrated need pursuant to §§ 1001 and 399.2.5. In reaching a determination under § 1001, the Commission is required by § 1002(a) to consider four factors: (1) community values; (2) recreational and park areas; (3) historical and aesthetic values; and (4) influence on the environment.[36]

Some of these factors are reviewed as part of the CEQA process. However, the Commission has concluded that § 1002 imposes a "responsibility *independent of CEQA* to include environmental influences and community values in our

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[35] Pub. Util. Code § 1001.

[36] Pub. Util. Code § 1002 (Added by Stats. 1981, ch. 573 § 3) provides, in pertinent part: "The commission, as a basis for granting any certificate pursuant to Section 1001 *shall* give consideration to the following factors:" (Emphasis added.) Those factors are noted above.

consideration of a request for a CPCN."[37] The Commission has also determined that, in evaluating the fourth factor, i.e., consideration of a project's "influence on the environment," it is appropriate to rely on the information gathered as part of the CEQA process.[38]

Regarding the Eldorado-Ivanpah Transmission Project, the Draft Joint EIR/EIS addresses not only the environmental impacts of the project but also the impacts on recreational and park areas and historic and aesthetic values. Accordingly, consistent with the Commission's prior statements, the Commission will look to the CEQA documents to inform its decision on the Eldorado-Ivanpah Transmission Project and also independently consider the information included in the CEQA documents when considering these four factors under § 1002(a).

4.2.1. Community Values

In considering the project's compatibility with community values as set forth in § 1002(a), the Commission gives considerable weight to the views of the local community and, in addition, the views of the elected representatives of the area because the Commission views elected representatives as speaking on

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[37] *Application of Southern California Edison for CPCN for Kramer-Victor Transmission Line,* (1990) 37 CPUC2d 413, 453. (Emphasis added.)

[38] *Application of Lodi Gas Storage for CPCN for Gas Storage Facilities,* D.00-05-048, 28 ["[T]he appropriate place for the parties to address [the issue of a project's influence on the environment] was in the EIR, so that the parties would not duplicate their efforts in both portions of the proceeding."].

behalf of their constituents.[39] No public or elected officials raised objections to this project in the CEQA public comment process or in the formal proceeding. In support of finding the project consistent with community values under § 1002(a), SCE asserts that the project will play a major role in the timely progress towards the Commission's renewable portfolio standard (RPS) goals.[40] As explained in more detail in Section 4.4.1 below, we agree with SCE that the project will advance the state's renewable energy goals, a program that is codified in state law pursuant to Senate Bill 1078 and modified by Senate Bill 107. However, we do not necessarily agree with SCE that the fact that a given project would advance statewide policy goals necessarily equates to compatibility with community values under the statute. Instead, consistent with past Commission decisions, we look to opinions expressed elected officials, or other representatives of the local community. No elected officials voiced concern regarding this project. Accordingly, while we do not have a basis to affirmatively find that the project advances community values; we believe we can reasonably find that the project is not inconsistent with those values.

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[39] *Application of Southern California Gas Company (U904G) to Amend its Certificate of Public Convenience and Necessity for the Honor Rancho Natural Gas Storage Facility,* Decision 10-04-034; 2010 Cal. PUC LEXIS 144, *18.

[40] SCE Opening Brief at 3-5. California Senate Bill (SB) 1078, Stats. 2002, ch. 516, established the RPS program, which was codified originally in California Public Utilities Code Sections 399.11, *et seq.* SB 1078 directed retail sellers of energy to include within their portfolios at least 20% of their total retail electricity sales from renewable generation sources by 2017. *Id.* In 2006, the Legislature enacted SB 107, Stats. 2006, ch. 464, which accelerated this deadline to 2010.

4.2.2. Recreational and Park Areas

In considering the project's impact on recreational and park area as set forth in Pub. Util. Code § 1002(a), we look to the Joint EIR/EIS as providing the most in-depth analysis of this issue.

Chapter 3.12 of the Joint EIR/EIS, entitled "Recreation," establishes that the Ivanpah-Eldorado Transmission Project "is in an area offering a diverse range of recreational opportunities that include caving, photography, paintings, automobile touring, backpacking, bird watching, hunting, primitive camping, hiking, rock climbing, and off-highway vehicles use."[41] Dry lake beds, such as the Ivanpah Dry Lake, are also popular destinations for long-distance archery, kite buggying, and kite demonstrations.[42] Other impacts on recreation include, for example, off-highway recreational vehicle trails currently authorized by BLM that run through the Ivanpah Solar Energy Generating System (ISEGS).[43]

SCE points out that, while its project presents temporary impacts to recreation resulting from construction of the Ivanpah-Eldorado Transmission Project, that impacts during operation and maintenance of the line would be similar its current operations of existing facilities.[44]

While construction of the project presents potential interference with the recreation and park areas, this impact will be short-term. Accordingly, we find

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[41] Joint FEIR/EIS at 3.12-1 and 3.12-2.

[42] Joint FEIR/EIS at 3.12-3.

[43] The analysis of the factors under § 1002(a)(1) - (4) does not include ISEGS, which was included as part of the Project as a Whole for the CEQA review.

[44] SCE Opening Brief at 5.

that the Eldorado-Ivanpah Transmission Project will not conflict with usages of the recreational and park areas. However, as further explained in Section 6.1.2 of the Final EIR/EIS, the ISEGS project, which is part of the whole of action, would result in significant and unavoidable impacts on land use and recreation due to the permanent conversion of habitat and land used for recreational purposes.[45] Thus while the impact of the Eldorado-Ivanpah Transmission Project when viewed in isolation imposes short-term impacts on recreational and park areas, the whole of the action results in longer term impacts that cannot be avoided.

4.2.3. Historical and Aesthetic Values

We again look to the analysis in the Joint EIR/EIS as providing the most in-depth information of matters related to historical and aesthetic values under Pub. Util. Code § 1002(a). Construction of the Eldorado-Ivanpah Transmission Project would impact cultural resources because of surface and subsurface ground disturbance.[46] This disturbance would result from new road construction, parking in areas off prepared roads, creation and use of temporary laydown areas, and drilling and leveling during construction of tower footings.[47]

SCE has proposed a number of mitigation measures, referred to as Applicant's Proposed Measures, to mitigate these and other similar impacts related to historical and aesthetic values. For example, Applicant's Proposed Measure APM CR-2a provides as follows: Project Final Design would avoid direct impacts on significant or potentially significant cultural resources. To the

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[45] Joint FEIR/EIS at 6-3.

[46] Joint FEIR/EIS at 3.5-15.

[47] Joint FEIR/EIS at 3.5-15.

extent practical, all ground-disturbing activities and other project components would be sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.[48] In describing the whole of the action, which includes the ISEGS project, the Joint Final EIR/EIS determines that the project will have non-mitigable impacts on visual resources, and furthermore states that these impacts would be significant and unavoidable, and there is no feasible mitigation to reduce this impact to less than significant levels.[49]

Consequently, after consideration of these facts, the Commission finds that the project, with the various Applicant's Proposed Measures, does conflict, to some degree, with historical and aesthetic values.

4.2.4. Influence on the Environment

The Joint EIR/EIS serves as the key reference document when considering the fourth factor, influence on the environment, under Pub. Util. Code § 1002(a).[50] As explained in the Joint EIR/EIS, the project will result in unmitigable[51] significant adverse impacts on biological resources, and air quality.[52]

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[48] Joint FEIR/EIS at ES-18.

[49] Joint FEIR/EIS at 3.2-69.

[50] We certify the FEIR/EIS in Section 6 below.

[51] The term "unmitigable" is used to mean that, it is not possible to avoid the effects or mitigate the effects to a point where no significant effects on the environment would occur. See, e.g., Public Resource Code § 21064.5.

[52] Joint FEIR/EIS at 6-1.

The project would impact several special-status wildlife species and their habitat.[53] However, as noted in the FEIR, while the project would impact several special status wildlife species and their habitat, mitigation would reduce these impacts to less than significant with the notable exception of the impacts on the desert tortoise,[54] which is listed as threatened by the federal government under the Endangered Species Act and by the State of California under the California Endangered Species Act.[55] The ISEGS project and Eldorado-Ivanpah Transmission Project together, as analyzed in the Joint EIR/EIS Whole of the Action, would cause increased road traffic, noise, human presence, disturbance, and general degradation of habitat during construction and operation, all of which are contributors to permanent adverse impacts on desert tortoise.[56] The ISEGS project would result in increased noise levels during daytime operational hours, a loss of desert tortoise habitat in the amount of over 3,582 acres, and increased road traffic increasing desert tortoise road kill hazard.[57] The Eldorado-Ivanpah Project increases the potential for raven predation of desert tortoise. However, the operational impacts of both projects would be significantly reduced by mitigation measures. This includes mitigation compensation required of both projects that would offset adverse impacts to desert tortoise. However, impacts on desert tortoise remain significant even after

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[53] *Ibid.*

[54] *Ibid.*

[55] Joint FEIR/EIS at 3.4-46.

[56] Joint FEIR/EIS at 3.4-126, 3.4-127.

[57] *Ibid.*

mitigation mainly due to the construction of both ISEGS and Eldorado-Ivanpah Transmission Project.[58] The Eldorado-Ivanpah Transmission Project and the ISEGS project would require relocation and the more intensively impactful translocation, respectively, of desert tortoises that occur during construction within the fenced construction area of the project. Specifically, SCE proposes as an Applicant's Proposed Measure, that "Any tortoise found on the surface would be relocated to less than 1,000 feet away."[59] Nevertheless, the impacts remain "significant and unavoidable."[60]

In addition to its impacts on the desert tortoise, the Joint EIR/EIS also finds that the construction activities undertaken to build the project would result in exceeding the Mojave Desert Air Quality Management District daily significant thresholds for particulate matter emissions ($PM_{2.5}$, PM_{10}), and nitrogen oxides (NO_X) despite the proposed usage of low-emission equipment and fugitive dust control measures. While these daily thresholds may be violated during the construction period, the Joint EIR/EIS also notes that these impacts would be temporary and confined to those times and locations when/where construction is underway.[61]

After taking all the above into consideration, we find the proposed project will have some adverse "influence on the environment" under § 1002(a). The finding that the project will have some adverse impacts relative to several of the

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[58] *Ibid.*

[59] Joint FEIR/EIS at 3.4-68.

[60] Joint FEIR/EIS at Section 3.4-96.

[61] Joint FEIR/EIS at 3.3-16.

factors identified in § 1002(a) is not necessarily determinative. Further analysis is required under the existing statutory framework to determine whether a project, despite it adverse impacts under § 1002(a) in some areas, is still in the public interest. The analysis under §1002(a) is narrow, looking only to the project specific impacts without consideration of the broader policy context into which the project fits. We now turn the broader analysis permitted by § 399.2.5.

Notably, under the "notwithstanding" provision of Public Utilities Code § 399.2.5, as further discussed below, the Commission may find that this project's furtherance of the state's renewable power goals outweigh the environmental concerns identified under § 1001 et seq.

4.3. Public Utilities Code § 1002.3

The next step in the Commission's analysis of SCE's request for a CPCN for the Eldorado-Ivanpah Transmission Project is § 1002.3.[62] Section 1002.3 requires the Commission to "consider cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity, including, but not limited to, demand-side alternatives such as targeted energy efficiency, ultraclean distributed generation...and other demand reduction resources." When an environmental impact report in being prepared,

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[62] Section 1002.3, effective January 1, 2006, was enacted in 2005 (Stats. 2005, ch. 366, Sec. 5), three years after § 399.2.5, as part of a larger energy efficiency bill, Senator Kehoe's SB 1037 and provides in full as follows: "In considering an application for a certificate for an electric transmission facility pursuant to Section 1001, the commission shall consider cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity, including, but not limited to, demand-side alternatives such as targeted energy efficiency, ultraclean distributed generation, as defined in Section 353.2, and other demand reduction resources."

pursuant to CEQA, an analysis of the non-wires alternatives is preferably included as an alternate to the proposed transmission line projects.

Consistent with § 1002.3, the Commission considered "non-wires" alternatives as part of its environmental review.[63] While a full analysis was not in the Draft EIR/EIS, this analysis was included in the Final EIR/EIS published on November 5, 2010, in response to comments on the Draft EIR/EIS. The evaluation of System Alternatives was modified to include two separate scenarios or sub-alternatives: in-basin generation and demand-side alternatives. These alternatives are further explained in Appendix A-1 to the Final Joint EIR/EIS. Appendix A-1 also explains the rationale for screening-out "non-wires" for further analysis.

Appendix A-1 to the Final Joint EIR/EIS suggests that demand-side and energy efficiency alternatives within the state could potentially result in 2.5 times more generation capacity than the generation capacity near the Ivanpah Dry Lake Area:

> In order to compare the capacity of the demand-side scenario to the capacity of the proposed project, it should be considered the potential capacity of additional renewable generation projects to be constructed in the Ivanpah Valley area and connected to the upgraded EITP transmission line should be considered. The proposed transmission line would be constructed within the Mountain Pass CREZ, which has an estimated generation capacity of 1,200 MW (CAISO 2009). Therefore, if all of the currently proposed demand-side generation projects were constructed and implemented before 2020, they would

[63] Appendix A-1 of Joint FEIR/EIS.

theoretically have 2.5 times over the generation capacity than the proposed project.[64]

During the environmental review process, the Center for Biological Diversity argued that non-wires alternatives exist and are less expensive than the Eldorado-Ivanpah Transmission Project. The Center for Biological Diversity relies on a number of studies, including a Commission report, which concludes that there would be little difference in the cost of meeting state renewable energy targets by relying predominantly on distributed photovoltaic (PV), when current state-of-the-art pricing is assumed, instead of building 10,000 MW of remote solar capacity under the 33% RPS reference case.[65]

The Final Joint EIR/EIS initially finds that demand-side alternatives could theoretically serve any capacity needs met through the potential generation interconnecting with the Eldorado-Ivanpah Transmission Project.[66] However, the conclusion of the Final Joint EIR/EIS is that the non-wires alternative will not be carried forward for full analysis under CEQA because it is highly speculative that the amount of "non-wires" generation needed to off-set the generation in the Ivanpah Dry Lake Area is feasible.[67] Furthermore as noted in the FEIR, the non-wires alternative would fail to meet one of the primary, and in our view, one of the principle objectives of the project, namely the interconnection of the

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[64] Joint FEIR/EIS at Appendix A-1 (Ap1-16).

[65] Joint FEIR/EIS at Comments by Center for Biological Diversity at Appendix G, comment 0024, citing the Commission's, *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, June 2009, at 31.

[66] Appendix 1, at Ap. 1-14 through Ap. 1-18 of the Joint FEIR/EIS.

[67] Appendix Ap1 at Ap1-15-Ap1-19 of the Joint FEIR/EIS.

renewable resources in the Ivanpah Dry Lake Area, including four projects with Commission approved PPAs.[68] On this basis, the Commission concludes it has met its obligations under 1002.3 to "consider cost-effective alternatives" to transmission facilities.[69]

4.4. Public Utilities Code § 399.2.5

The next step in the Commission's analysis is to determine whether § 399.2.5 applies here. Section 399.2.5 was originally enacted as § 399.25 on September 12, 2002, as part of SB 1078. Section 399.25 was re-codified as § 399.2.5, but the text remained unchanged.[70] Section 399.2.5 was recently amended, but the amendments are not relevant to the discussion here.[71]

Section 399.2.5 authorizes the Commission to deem necessary those transmission facilities identified in CPCN applications if the proposed facilities are *necessary to facilitate achievement of the State's renewable power goals.* The State's renewable power goals, described, in part, in § 399.11, include the goal "to attain a target of generating 20 percent of total retail sales of electricity in California from eligible renewable energy resources by December 31, 2010..." Section 399.2.5 also provides a "backstop" cost mechanism allowing the utilities to recover through retail rates any prudently incurred costs that are not approved by the Federal Energy Regulatory Commission for recovery through transmission rates. The Commission implemented the cost recovery provisions

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[68] SCE Opening Brief at 8-9.

[69] Appendix Ap1 at Ap1-15-Ap1-19 of the Joint FEIR/EIS.

[70] Stats. 2008, Ch. 558, Sec. 22. Effective January 1, 2009.

[71] AB 1954 (Skinner/Perez), Stats. 2010, Ch. 460. Effective January 1, 2011.

of § 399.2.5 in D.03-07-033 and in D.06-06-034. Because the proposed project is intended to interconnect renewable generation in furtherance of the state's goal pursuant to § 399. 11, we find that the provisions of § 399.2.5 apply here.

In this proceeding, SCE characterizes the "need" analysis under § 399.2.5 as establishing a presumption of need.[72] Moreover, in a recent case, the Commission stated "Section 399.2.5 explicitly supersedes § 1002 in determinations of need for a CPCN."[73] To clarify, no presumption of need is created and, while § 399.2.5 permits the Commission to, in essence, "supersede" §§ 1001-1013, such authority is only provided *after* the Commission fully considers the requirements of §§ 1001-1013, including the analysis required by § 1002.

Accordingly, the determination of "need" under § 399.2.5, and the availability of backstop cost recovery under that section, necessarily must occur at the *end* of a CPCN proceeding, after the Commission evaluates all of the evidence of need under §§ 1001-1013. This sequence of review brings meaning to the "notwithstanding" provision of § 399.2.5. It is only at the end of the Commission's need analysis under §§ 1001-1013 that the provisions of § 399.2.5 provide the Commission with the authority to find that "notwithstanding" the results of its analysis under §§ 1001-1013, the project may be found "necessary to facilitate" achievement of the renewable power goals of § 399.11 et seq. and, therefore, approved by the Commission.

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[72] SCE Opening Brief at 6, "Among other things, Section 399.2.5 creates a presumption of need for transmission projects that facilitate delivery of renewable energy to the grid."

[73] D.09-12-044 at 18.

We have, above, considered the relevant provisions of §§ 1001-1013. We now turn to the § 399.2.5 analysis, the three-prong test for which projects would qualify as "necessary to facilitate" achievement of the States' renewable power goals under § 399.11 et seq., and thereby qualify for cost recovery under the statute.

4.4.1. Three Prong Test

In D.07-03-012,[74] the Commission established the following three prong test for which projects would qualify as "necessary to facilitate" achievement of the State's renewable power goals under § 399.2.5, and thereby qualify for the cost recovery under the statute:

> (1) that a project would bring to the grid renewable generation that would otherwise remain unavailable; (2) that the area within the line's reach would play a critical role in meeting the RPS goals; and (3) that the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance.[75]

The first prong requires that the Eldorado-Ivanpah Transmission Project bring to the grid renewable generation that would otherwise remain unavailable. Unlike other recent transmission projects, this project is not being developed to meet demand.[76] The main purpose of the project is to bring yet-to-be constructed wind and thermal solar projects to the CAISO-controlled grid. SCE's current

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[74] D.07-03-012 (The decision approving Segment 1 of the Tehachapi Renewable Transmission Project.)

[75] D.07-03-012 at 16. Applied in D.07-03-045 and D.09-12-044.

[76] The Final EIR/EIS finds that accessing renewable energy is the purpose of the project with "energy demand met by other means." (Final EIR/EIS at 6-9.)

interconnection capability in the Ivanpah Dry Lake Area is limited to approximately 80 MW via the existing line between the Mountain Pass Substation and the Eldorado Substation, on the Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115 kV transmission line.[77]

The renewable generation projects identified for potential interconnection with the Eldorado-Ivanpah Transmission Project are in various stages of development. No projects are presently generating renewable electricity. Some of these renewable generation projects present an initial start date of a few years away, perhaps as early as 2013,[78] while other projects are more speculative.

In the context of renewable energy development, it is often the case that transmission must be planned and permitted before generation fully commits to an area. This is the situation here. Furthermore, in this case generation developers, and by extension, their financial backers, need assurance that if generation is built, their projects will be able to bring their energy to market. Once planned and permitted, transmission to the Ivanpah Dry Lake Area is likely to increase interest in a renewable generation development. Consequently, in this case, the Commission is looking to the renewable potential for the area that the transmission line will serve as an indicator of the need for the proposed line. Our analysis continues to emphasize the amount of generation already under RPS contracts with the investor owned utilities, and, in this case, gives

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[77] Exhibit SCE-5, Section A at 8:20-26.

[78] The initial synchronization may occur a few months early, in November 2012. SCE Advice Letter 2339.

some weight to the number of interconnection requests in the area as an indicator of future growth.

Based on Commission-approved PPAs, the reasonably foreseeable capacity that can be expected to interconnect to Eldorado-Ivanpah Transmission Project is considerable. Four solar projects totaling 717 MW[79] of renewable generating capacity in the Ivanpah Dry Lake region have CPUC-approved PPAs with investor owned utilities. All of these projects have filed interconnection requests with the CAISO and are seeking interconnection to the CAISO system through Eldorado-Ivanpah Transmission Project.[80] Notably, and consistent with the requirements and applicability of § 399.2.5, all of these projects were approved in part because of the contribution they are expected to make toward California's 20% RPS goals.[81]

We disagree with DRA's position, as presented in briefs, that these projects are not sufficiently mature or certain to justify a need determination for the proposed transmission project.[82] These generation projects have Commission approved PPAs, and as such have been assessed and were ultimately endorsed by the Commission based not only on cost relative to other resource options, but

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[79] Exhibit SCE-8.

[80] Exhibit SCE- 14

[81] The 717 MW of capacity, as reflected in Exhibit SCE-8, are represented by four PPAs, two with SCE, Solar Partners 1 and Desert Stateline, and two with PG&E, Brightsource PPA 1 and Brightsource PPA 2. These projects were approved via Resolutions E-4261, E-4347, and E-4266, respectively. Each resolution contains language expressly recognizing the role these projects are anticipated to play in meeting the 20 percent RPS goal. (See, E-4261 at 8, E-4347 at 7, and E-4266 at 9.)

[82] DRA Opening Brief at 10-13.

also on the basis of project viability. As such we find that these projects are strongly indicative of a line that if built, will be utilized.

This conclusion is further supported by information regarding potential generation projects in the Renewable Energy Transmission Initiative (RETI) Phase 2B report regarding the region's resource potential. DRA also makes a number of arguments questioning whether the energy from the projects that are anticipated to interconnect to Eldorado-Ivanpah Transmission Project will deliver energy to California end use customers.[83] The extent to which projects will serve end use customers consistent with the eligibility requirements of the RPS program are fully addressed when the Commission reviews contracts submitted by the utilities as part of their RPS procurement activities. We find DRA's concerns in this regard to be misplaced and out of scope to the extent they have failed to demonstrate that the resources anticipated to utilize this line are ineligible under the RPS.

Of the projects with Commission approved PPAs, we note that the project by Brightsource's subsidiary companies, the Ivanpah Solar Energy Generating System project or ISEGS, is the project furthest along in the permitting process, having received the necessary permits or approvals by the California Energy Commission and BLM. ISGES initiated construction soon after October 27, 2010.[84] ISEGS alone could serve to satisfy the first prong the Commission's test under § 399.2.5, that a proposed transmission project would

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[83] DRA Opening Brief at 7-9.

[84] http://www.brightsourceenergy.com/images/uploads/press_releases/Ivanpah_Groundbreaking_Press_Release.pdf.

bring to the grid renewable generation that would otherwise remain unavailable. However, as stated by Brightsource, other transmission options exist for the project.[85]

While other transmission options may exist, we find that the substantial amount of renewable capacity represented not only by Brightsource's ISEGS project, but also by the capacity associated with the other Commission-approved renewable PPAs in the region results in the need for additional transmission capacity. This has been confirmed by the CAISO, which, in its studies responding to these projects' respective interconnection requests, has indicated that Eldorado-Ivanpah Transmission Project would be required.[86]

It is also notable, that in addition to those projects with approved PPAs, there is approximately 964 MW of renewable generation in the CAISO Generation Queue[87] that would, if realized, potentially interconnect to Eldorado-Ivanpah Transmission Project. Furthermore, the region has been identified in the RETI Phase 2B report as having substantial renewable potential,

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[85] Brightsource June 21, 2010 comments to the Joint FEIR/EIS at 2, included in Joint FEIR/EIS in Appendix G at comment 0016.

[86] DRA Exhibit C-302-A CAISO confidential documents:

Interconnection System Impact Study, Generation Interconnection DPT2 Project Final Report at ii, iii.

Interconnection System Impact Study, Generation Interconnection, LLC., DPT1 Project Final Report at ii, iii.

Interconnection System Impact Study, Generation Interconnection, Ivanpah Solar Electric Generating System 3 Final Report at ii, iii.

[87] Exhibits SCE-9, 10 and 11.

with an estimated 958 MW of potential in the Mountain Pass Competitive Renewable Energy Zone (CREZ) and 5,042 MW of potential in the Nevada-Southwest area.[88]

Having approved renewable PPAs expressly seeking interconnection to a given transmission facility is helpful in ensuring that lines built to access renewables are fully utilized and the risk of stranded costs is reduced accordingly. Here, we not only have Commission-approved PPAs that collectively exceed the available capacity of the existing CAISO system, but strong commercial interest in the region as evidenced by the CAISO interconnection queue, and a regional assessment, RETI, that confirms the region has substantial renewable resource potential to justify this interest. Based on this information, and the limited capacity available on SCE's existing lines, to facilitate interconnection of these resources to the CAISO system, additional transmission capacity is needed.

In light of the forgoing discussion, we conclude that Eldorado-Ivanpah Transmission Project meets the first and second prongs of the three prong test used to determine if a project meets the "necessary to facilitate" language of § 399.2.5. The Eldorado-Ivanpah Transmission Project satisfies the first prong of the test because it will facilitate interconnection with those generation projects with Commission-approved PPAs located in the area. Furthermore, the considerable amount of renewable potential in the region, beyond those projects with Commission-approved PPAs, as demonstrated by the substantial amount of

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[88] RETI Phase 2B Final Report, 1-10 – 1-12. http://www.energy.ca.gov/2010publications/RETI-1000-2010-002/RETI-1000-2010-002-F.PDF.

generation in the CAISO Generation Queue, and the results of the RETI Phase 2B study, convinces us that the project satisfies the second prong.

Accordingly, we find that the Applicant has established by a preponderance of the evidence that Eldorado-Ivanpah Transmission Project is needed to bring to the grid renewable generation that would otherwise remain unavailable and that the area within the line's reach would play a critical role in meeting the state's RPS goals.

We now turn to the third prong, regarding whether the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance. Based on the existing PPAs, as well as the identified resource potential in the region, we believe the line would, if built, contribute toward economically rational RPS compliance. This leaves the question of whether or not the costs of this line are reasonably balanced against this opportunity. As described in more detail below, we find that the cost of the project, as modified herein, is reasonable given the project scale and scope, thus satisfying the third prong. In light of the forgoing discussion we find that the project meets the requirements of the three prong test and is, thus, "necessary to facilitate achievement of the renewable power goals established in Article 16."

4.4.2. Back-Stop Cost Recovery

After the Commission determines a transmission project is "needed" under § 399.2.5, the project is then eligible for backstop cost recovery for prudently incurred transmission costs "resulting from the construction of the transmission facilities that are not approved for recovery in transmission rates by

[Federal Energy Regulatory Commission]..."[89] Thus, SCE must seek to recover costs for transmission projects through Federal Energy Regulatory Commission jurisdictional rates and, if Federal Energy Regulatory Commission denies recovery, § 399.2.5(b)(4) permits recovery of transmission rates through the retail rates governed by the Commission.

The provisions of § 399.2.5 apply to new transmission facilities "necessary to facilitate achievement of the renewable power goals." These renewable power goals are set forth in § 399.11. As explained in the preceding section, we find that the Applicant has demonstrated that the project is needed, consistent with the requirements of § 399.2.5. Therefore we find that the project is eligible for backstop cost recovery.

Section 399.2.5 (b)(4) ensures retail rate recovery of prudently-incurred costs for projects the Commission finds to be necessary to facilitate RPS compliance to the extent that cost recovery is not otherwise available.

There is no question that the Eldorado-Ivanpah Transmission Project qualifies for cost recovery under § 399.2.5(b)(4). D.06-06-034 defined certain types of facilities that would qualify for cost recovery under § 399.2.5(b)(4), including:

> High voltage, bulk-transfer transmission facilities, whether classified as network or gen-tie, that are designed to serve multiple RPS-eligible generators where it has been established that the amount of added transmission capacity will likely be utilized by RPS-eligible generation projects within a reasonable period of time .... (D.06-06-034, mimeo., Finding of Fact 8).

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[89] Pub. Util. Code § 399.2.5(b)(4).

As described above, we find that the Eldorado-Ivanpah Transmission Project is necessary as that term is used in the context of § 399.2.5, because it will be used interconnect renewable resources that will contribute to the 20% RPS goal. That the proposed project is a high voltage, bulk-transfer transmission facility is not disputed. Consequently, it is appropriate to provide SCE assurance of recovery of prudently incurred costs, and we do so here.

Section 399.2.5 also requires the Commission to direct "the utility…to seek the recovery through general transmission rates of the costs associated with the transmission facilities." Therefore, we direct SCE to first seek cost recovery at Federal Energy Regulatory Commission through general transmission rates for the costs incurred in building this project. Further, we reiterate our finding in D.06-06-034: "§ 399.25 is not meant to substitute for the existing cost recovery mechanisms available to support transmission development, nor is it intended to change the ultimate cost responsibility of generators and utility ratepayers." (*Id.* at p. 28). "Nothing in this decision is intended to relieve renewable generators from their responsibility for their fair share of the costs of non-network transmission facilities necessary to interconnect the generator with the network." (*Id.* at Findings of Fact 7.)

We affirm, consistent with D.06-06-034, that, notwithstanding the likelihood of cost recovery through Federal Energy Regulatory Commission wholesale rates, it is appropriate for SCE to continue to track its project costs consistent with the terms of the memorandum account approved by the Commission in response to SCE Advice Letter 2345-E.[90] Both the statute and

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[90] CPUC Resolution E-3405 (December 17, 2009).

D.06-06-034 anticipate that first Federal Energy Regulatory Commission would act, and that this Commission would step in only if Federal Energy Regulatory Commission disallows recovery of some costs. Thus, any consideration of cost recovery by this Commission would only come after Federal Energy Regulatory Commission had finished its work.

5. California Environmental Quality Act

CEQA and § 1002(a) require the Commission to consider the influence of the Applicant's request on the environment.[91] Toward that goal, CEQA requires the Commission, as the Lead Agency, to conduct a review to identify environmental impacts of the project and ways to avoid or reduce significant environmental damage. This review is documented in a joint EIR/EIS. The EIR/EIS serves to disclose any environmental impacts associated with a proponent's project, list mitigation measures to minimize any significant environmental effects of the project, and provide project alternatives. This information is used to assist the Commission in determining whether to issue a CPCN. CEQA precludes a lead agency from approving a proposed project unless the lead agency requires the project proponent to eliminate or substantially lessen all significant effects on the environment where feasible, and determines that any unavoidable remaining significant effects are acceptable due to overriding considerations. CEQA requires that, prior to approving the project or a project alternative, the lead agency certify that the environmental review was conducted in compliance with CEQA, that it reviewed and considered the

[91] Public Resources Code §§ 21000, et seq.

EIR prior to approving the project or a project alternative, and that the EIR reflects its independent judgment.[92]

5.1. Applicant's Proponent's Environmental Assessment, Project Objective, Project as a Whole, and Alternatives

5.1.1. Proponent's Environmental Assessment and the Statement of Objectives

SCE filed a PEA with its Application. A PEA is required to contain a statement of objectives. The purpose of the statement of objectives is to help the lead agency develop a reasonable range of alternatives to evaluate and aide the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should also include the underlying purpose of the project. (CEQA Guidelines § 15124.) SCE's project objective is reproduced below:[93]

> 1. Comply with the state-mandated Renewables Portfolio Standard (RPS) (i.e., 20 percent renewable by year 2010 per California Senate Bill 107[1]) in an orderly, rational, and cost effective manner, while also considering the need for maintaining reliable electric service during the upgrade and/or construction of new facilities.
>
> 2. Integrate planned renewable generation resources[2], including up to 1,400 MW from the Ivanpah Dry Lake Area with a Power Purchase Agreement (PPA) executed by a California Public Utilities Commission (CPUC) jurisdictional Private Transmission Owners (PTO), in a manner that minimizes potential environmental impacts

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[92] Pub. Res. Code § 21082.1(c)(3); CEQA Guidelines § 15090.

[93] The below excerpt is from SCE's PEA (at 1-1 and 1-2) for "project objective." This language is different than the PEA "project objective" found in the EIR/EIS (at 1-8 at Section 1.2.1).

and impacts to existing and planned residences, where feasible, by maximizing the use of existing transmission corridors in order to:

a) maximize the use of existing, previously disturbed transmission line right-of-way (ROW) to minimize effect on previously undisturbed land and resources;

b) select route and tower locations with the lowest potential for environmental impacts while still meeting Proposed Project objectives; and

c) select the shortest feasible route that minimizes environmental impacts and Proposed Project costs.

3. Interconnect and deliver energy from up to 1,400 MW of renewable resources located in the Ivanpah Dry Lake Area in a way that complies with all applicable North American Electric Reliability Council (NERC)/Western Electric Coordinating Council (WECC) Planning Standards, and in a manner that minimizes transmission line crossings.

4. Support the State of California Greenhouse Gas Reduction Program.

5. Assist the BLM in meeting the federal directive to develop 10,000 MW of renewable generations.

5.1.2. The Project Objective

The Commission, together with the BLM, adopted the following objectives for the project:

Based on the content of the PEA and related federal and state objectives, the CPUC and the BLM have abridged the objectives for the proposed project to the following:

1. To connect renewable energy sources in the Ivanpah Valley area in compliance with Executive Order 13212, EPAct, the Federal

Power Act, California Senate Bill 1078, and California Senate Bill 107;

2. To improve reliability in compliance with applicable standards, including NERC, WECC, CAISO, and SCE standards; and

3. To maximize the use of existing ROW and designated utility corridors to minimize impacts on environmental resources. [94]

5.1.3. Project as a Whole

Both CEQA and NEPA stipulated that assessment is not limited to only the project components. Under CEQA, a "project" is defined as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment"[95] The Joint EIR/EIS incorporates the ISEGS project as part of the "whole of the action" and describes the relevant features of the ISEGS project found in the Final Staff Assessment/Draft EIR (FSA/DEIR) of the ISEGS project conducted by the CEC and the BLM.[96] The FSA/DEIS conclude that the ISEGS project would result in significant impacts.[97] Given the geographical proximity and the overlapping schedules of the Eldorado-Ivanpah Transmission Project, it is reasonable to assume that the Eldorado-Ivanpah Transmission Project, when

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[94] Joint FEIR/EIS at 1-11.

[95] CEQA Guidelines § 15378(a).

[96] CEC Application for Certification 07-AFC-5.

[97] Joint FEIR/EIS at 2-37.

considered in combination with ISEGS, would contribute cumulatively significant impacts.[98]

5.2. Applicant's Proposed Measures

Applicant's PEA proposes specific procedures to the project construction plans to minimize the environmental impact from the proposed project. These specific procedures are referred to as Applicant's Proposed Measures (APMs). The PEA's impact analysis assumes that the applicable APMs would be implemented to reduce air quality impacts. We adopt the APMs as part of our review of the proposed project and Applicant is required to comply with the APMs and the other mitigation measures contained in the Mitigation Monitoring, Reporting, and Compliance Program. The Commission shall monitor compliance with the Plan periodically throughout the duration of construction activities.

6. Certification of Final Joint EIR/EIS

The Commission must certify the Final Joint EIR/EIS. (CEQA Guidelines § 15090.)

We hereby certify that:

- The Final Joint EIR/EIS has been completed in compliance with CEQA.
- The Final Joint EIR/EIS was presented to the Commission, and the Commission has received, reviewed, and considered the information contained in the EIR/EIS prior to approving the project.

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[98] *Ibid.*

- The Joint Final EIR/EIS reflects the Commission's independent judgment and analysis.

7. CEQA Findings

Based upon the Joint Final EIR/EIS, we have prepared a set of CEQA Findings pursuant to CEQA Guidelines § 15091 regarding the significant impact associated with the proposed project. These findings are set forth in Attachment B to this decision. We find that the CEQA Findings accurately reflect the independent analysis contained in the Final Joint EIR/EIS and are supported by substantial evidence in the administrative record. We adopt them as Findings of Fact in this decision and incorporate them by reference herein.

7.1. CEQA - Environmentally Superior Alternative

CEQA imposes a general duty on public agencies to avoid or minimize, to the greatest extent possible, the environmental effects of projects they approve.[99] This duty generally is implemented by identifying and then adopting mitigation measures and/or alternatives to the project that will avoid or reduce environmental impacts.[100] To this end, CEQA requires that the Joint EIR/EIS identify an environmentally superior alternative among the alternatives evaluated.[101] There were 18 alternatives evaluated in the Joint FEIR/EIS. In

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[99] *County of San Diego v. Grossmont-Cuyamaca Community College Dist.* (2006) 141 Cal.App.4th 86, 98; Pub. Res. Code § 21002; 14 Cal. Code Regs. ("CEQA Guidelines") § 15021.

[100] Pub. Resources Code §§ 21100(b)(3), (4), 21003(c) [EIR should emphasize feasible mitigation measures and alternatives]; CEQA Guidelines §§ 15002(f), (h), 15126.4, 15126.6; *Laurel Heights Improvement Assn. v. The Regents of the University of California* (1988) 47 Cal.3d 376, 400-403.

[101] Joint FEIR/EIS at Section 4; CEQA Guidelines §§ 15126.6(a) and (e)(2).

contrast with the other routing and telecommunication alternatives evaluated in this Draft EIR/EIS, the proposed project would have less land disturbance and less significant impacts on sensitive biological resources, and it would meet all of the project's objectives.[102] Neither of the two remaining alternatives, which include the No Project alternative and the non-wires alternative, meets the project objectives. Therefore, the proposed route was determined to be the environmentally superior alternative among alternatives that would meet the Commission's project objectives as set forth in the Joint EIR/EIS.[103]

7.2. CEQA – Significant Environmental Effects, Statement of Overriding Consideration, and Rationale

Although the Environmentally Superior Alternative is the least environmentally damaging alternative, it does not mitigate all significant environmental impacts as described below and as further described in the Final Joint EIR/EIS. The whole of action, which includes the proposed Eldorado-Ivanpah Transmission Project as well as ISEGS, has significant and unavoidable adverse impacts on a number of areas including air quality, biological resources, land use, and visual resources. These impacts are summarized below.

Air Quality: Though impacts on air quality resulting from the whole of the action would not be long-term, the project would result in significant and unavoidable adverse impacts on air quality due to temporary emission increases of NOx, volatile organic compounds (VOCs), and PM10, associated with construction activities. These emissions would contribute to a cumulatively considerable net increase of a criteria pollutant in a non-attainment area, and

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[102] Joint FEIR/EIS at 4.7.

[103] *Ibid.*

temporary impacts on ambient air quality. As such the whole of the action/cumulative action will result in significant and unavoidable impacts to air quality.[104]

Biological Resources: The whole of the action would significantly and adversely affect biological resources, in particular resulting in unmitigable significant and unavoidable impacts to the desert tortoise. These impacts are caused primarily by construction activities of the two projects. Overall, the impacts on biological resources, with the notable exception of the impacts on the desert tortoise, from the whole of the action would be less than significant.[105]

Land Use: The whole of the action is found to have significant and unavoidable impacts on land use, largely resulting from the permanent conversion of habitat and recreational lands.[106]

Visual Resources: The whole of the action is found to have significant and unavoidable impacts on visual resources. The FSA for ISEGS project would result in significant and unavoidable visual impacts affecting the following viewer groups: the Primm Valley Golf Course, viewpoints in the Mojave National Preserve on the eastern face of Clark Mountain, and viewpoints in the Stateline Wilderness Area, including the Umberci Mine, and the middleground distance view on Highway I-15.[107] Additionally, the ISEGS project would result in lighting impacts for viewers in the Mohave National Preserve, because FAA safety lighting for the ISEGS project would result in an adverse and unavoidable impact on nighttime views. Collectively, then, the impact of the whole of the

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[104] Joint FEIR/EIS at 3.3-34.

[105] Joint FEIR/EIS at 3.4-127.

[106] Joint FEIR/EIS at 5-88.

[107] California Energy Commission (CEC) and Bureau of Land Management (BLM) 2009. Final Staff Assessment/Draft Environmental Impact Statement of the Ivanpah Solar Electric Generating System Project (CEC-700-2008-013-FSA). October Section 6.12, and California Energy Commission (CEC) 2010. Final Staff Assessment Addendum for the Ivanpah Solar Electric Generating System. March Section 6.

action on these viewers, including light impacts, would be significant and unavoidable. Importantly there are no feasible mitigation measure to reduce this impact to less than significant levels.[108]

7.3. Statement of Overriding Considerations

As explained above, the authorized Environmentally Superior Alternative and the combined Environmentally Superior Alternative and ISEGS project will have significant environmental impacts, a number of which cannot be mitigated. Therefore, the Commission must provide a statement of the overriding considerations pursuant to CEQA Guidelines § 15093. The Commission will not provide a statement of overriding consideration for the ISEGS project as this project has already been reviewed and certified.

The Commission recognizes that significant and unavoidable environmental impacts will result from construction and operation of the Environmentally Superior Alternative. Having: (1) adopted all feasible mitigation measures; (2) recognized all significant, unavoidable impacts; and (3) balanced the benefits of the Environmentally Superior Alternative against its significant and unavoidable impacts, the Commission hereby finds that the benefits of the project outweigh and override the significant unavoidable impacts for the reasons stated below. The Environmentally Superior Alternative will provide substantial benefits, including, but not limited to, facilitating California's renewable energy goals within a reasonable timeframe as well as advancing the state's efforts to reduce its carbon emissions consistent with Assembly Bill 32 (Stats. 2006, ch. 488).

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[108] Joint FEIR/EIS at 3.2-68 and 3.2-69

The Commission finds that the Environmentally Superior Alternative's unavoidable impacts are acceptable in light of these substantial benefits, which constitute an overriding consideration warranting approval of the project.

7.4. Mitigation Monitoring

The Final EIR/EIS includes a proposed Mitigation Monitoring Plan (Final EIR/EIS, Appendix E.) for the mitigation measures it recommends for the Proposed Project. The tables are presented in the Final EIR. These tables, along with the full text of mitigation measures applicable to the Environmentally Superior Alternative, form the Draft Mitigation Monitoring Plan. The plan is designed to ensure compliance with the changes in the project and mitigation measures imposed on the authorized project during implementation. It also recommends a framework for implementation of the Mitigation Monitoring Plan by this Commission and by BLM as the CEQA and NEPA Lead Agencies, respectively. We adopt the Mitigation Monitoring Plan.

8. Electric and Magnetic Fields

The Commission has examined the impact of electric and magnetic fields (EMF) in several previous proceedings.[109] The Commission found the scientific evidence presented in those proceedings was uncertain as to the possible health effects of electromagnetic fields and did not find it appropriate to adopt any related numerical standards. Because there is no agreement among scientists that exposure to EMF creates any potential health risk, and because CEQA does not define or adopt any standards to address the potential health risk impacts of

[109] D.06-01-042; D.93-11-013.

possible exposure to EMF, the Commission does not consider magnetic fields in the context of CEQA and determination of environmental impacts.

The Commission requires, pursuant to GO 131-D, that all requests for a CPCN include a description of the measures taken or proposed by the utility to reduce the potential for exposure to EMF generated by the proposed project. The Commission developed an interim policy that requires utilities, among other things, to identify the no-cost measures undertaken, and the low-cost measures implemented, to reduce the potential EMF impacts. The benchmark established for low-cost measures is 4% of the total budgeted project cost that results in an EMF reduction of at least 15% (as measured at the edge of the utility right-of-way). SCE's Field Management Plan, included at Exhibits SCE-3 and incorporated into the design of the proposed project, addresses the EMF mitigation measures that will be taken in connection with the proposed project.

We adopt SCE's Field Management Plan for the proposed project and require SCE to comply with it.

9. Costs

SCE has provided sufficient evidence to support its cost estimate for the project, including SCE's preliminary total estimated costs—excluding Allowance for Funds Used During Construction (AFUDC) costs for the proposed route and all alternatives, as required by Pub. Util. Code § 1005.5(a).[110] With the exception of AFUDC, all cost estimates are provided in 2009 constant dollars. In addition, SCE's cost estimating methodology is appropriate. Consistent with Commission practice, SCE did not include AFUDC costs for purposes of estimating the total

[110] Exhibit SCE-1 (Chien) at 12.

maximum reasonable and prudent costs. It is also appropriate for SCE to use deflation factors to convert actual expenditures in future years to their equivalent value in 2009 dollars.

As part of SCE's direct costs estimate, SCE incorporates the costs associated with complete redundancy for the Special Protection System (SPS).[111] The SPS system includes a primary telecommunications line that will run along the new 220 kV line and a second telecommunications line, the redundant line, that will traverse approximately 35 miles in California and Nevada. The redundant telecommunications line is referred to as Telecom Path 2. Telecom Path 2 would be built along the existing SCE 500 kV Eldorado-Lugo transmission line and transmitted via microwave facilities.[112]

SCE explains that the Telecom Path 2 is strongly encouraged by the North American Electric Reliability Corporation (NERC)/Western Electricity Coordinating Council (WECC) Planning Standards but also indicates that "precontingency generation curtailment" might be an alternative to the additional line.[113] DRA argues that Telecom Path 2 is not needed and, as a result, the costs should be excluded.[114] DRA's arguments points to generation curtailment or load shedding as a reasonable and acceptable alternative to construction of Telecom Path 2.[115]

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[111] Exhibit SCE-1 at 12.

[112] Joint FEIR/EIS at 2-35.

[113] SCE Reply Brief at 20.

[114] DRA Opening Brief at 4 and Reply Brief at 2.

[115] DRA Opening Brief at 4-5.

In contrast to DRA, SCE states that the SPS is critical to enabling the Eldorado-Ivanpah Transmission Project to be fully utilized.[116] SCE argues that because the SPS only disconnects renewable resource under abnormal conditions, which, by definition are rare, the SPS ensures the ability of the line to be fully utilized during normal operating conditions. SCE has adequately demonstrated the prudency of the Special Protection Systems and its consistency with CAISO planning standards and NERC/WECC planning standards.

Regarding SCE's proposed contingency, it suggests a 35% contingency, citing to SCE's recent experience with the Antelope-Pardee Transmission Project 1 (Antelope 1) and Antelope-Pardee Transmission Project 2 and 3 (Antelope 2 and 3).[117] SCE further suggests that the amount of contingency as a percentage of the cost estimate will decrease as the project scope is better defined. SCE's requested contingency exceeds the amounts, generally between 5% and 15%, recently adopted by the Commission and requested by applicants for similar transmission projects in California.[118] Consistent with precedent, we adopted a contingency of 15%.[119] This contingency will be applied to the total project costs of $306.338 million, as noted at Exhibit SCE-1.

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[116] SCE Reply Brief at 20-22.

[117] SCE Opening Brief at 30.

[118] DRA Opening Brief at 13.

[119] D.09-12-044 at 69-71.

SCE also requests that the Commission find that its preliminary cost estimates of $306 million (constant 2009 dollars), excluding contingency and corporate overhead,[120] qualify as reasonable and prudent under California Public Utilities Code Section 1005.5(a). This "reasonable amount" is sometimes referred to as a "cost cap."[121] In the future, if circumstances warrant, SCE would request the Commission to consider an appropriate request from SCE for an increase of the reasonable and prudent cost cap pursuant to Section 1005.5(b). We adopt as reasonable a cost cap under § 1005.5 the total amount noted in Attachment A to Exhibit SCE-1, direct costs of $306.338 million plus a 15% contingency.

10. Public Utilities Section 625 Notice Requirements

SCE states it will comply with the applicable notice requirements in California Public Utilities Code Section 625, should SCE become aware of any need to condemn property for competitive purposes during this process. We affirm that SCE must comply with Section 625 as needed.

11. Comment Period

The alternate proposed decision of the Commissioner in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments on the Proposed Decision and Alternate Proposed Decision were filed on December 6, 2010 by Southern California Edison, jointly by Brightsource and First Solar, the Division of Ratepayer Advocates, the Center for Biological Diversity, and Western Watersheds Project,

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[120] Exhibit SCE-1 at 19.

[121] Exhibit SCE-1 at 20:7-8.

and reply comments were filed on December 13, 2010 by Southern California Edison, jointly by Brightsource and First Solar, the Center for Biological Diversity, and the Division of Ratepayer Advocates.

SCE's comments focused primarily on the Proposed Decision which denies the SCE's application. In particular, SCE argues that the requirement implied by the PD, that available capacity on the transmission systems of other transmission providers must be fully evaluated before a CPCN can be granted, is unduly burdensome and would, if adopted create a significant barrier to renewable development. SCE notes in particular that neither SCE nor CAISO can conduct system impact studies to evaluate the affect of interconnecting renewables to third party transmission systems, like LADWP and NV Energy, both of which own high voltage transmission in the vicinity of the proposed project. Similarly, SCE notes the CPUC has no authority to compel these entities to conduct such studies. Lastly, on this point, SCE argues that the approach taken in the PD would force generators to pursue interconnection studies with multiple transmission system providers in a given region, dramatically increasing the time, cost and uncertainty associated with the interconnection process. To the extent projects are able to interconnect, it will lead to a piecemeal solution and upgrades to the transmission system to facilitate renewable compliance, contrary to the intent of § 399.2.5. SCE disputes the PD's finding that the line is not needed based on the speculative nature of the projects that would use the line if built. SCE also argues that the PD's characterization of Desert Tortoise fragmentation is incorrect. In light of these arguments SCE supports the Alternate Proposed Decision.

Brightsource and First Solar also support the APD and make many similar arguments as those of SCE regarding the PD. Brightsource and First Solar argue

that the PD strays from the intent of the § 399.2.5 by introducing a new standard/requirement for approval, namely requiring SCE to analyze available capacity on non-CPUC jurisdictional transmission systems, which creates additional project development barriers rather than facilitating renewable development. This, in their view, also conflicts with the SCE's obligations pursuant to the CAISO tariff and the Federal Power Act, namely that SCE take the appropriate steps to interconnect these resources when interconnection is requested. They further argue that the approach proposed in the PD is impractical given the fact that these third-party facilities are not subject to these requirements, creating a great deal of uncertainty in the interconnection process. Brightsource and First Solar suggest that the PD conflicts with Commission precedent noting that the approach in the PD regarding third party transmission system capacity was not imposed in the case of decisions granting CPCNs for Tehachapi segments 1-3 and Tehachapi segments 4-11. Because the PD would essentially force developers to engage in multiple interconnection processes, Brightsource and First Solar allege it would dramatically increase the regulatory burden to transmission development to the detriment of project developers. In the case of this application in particular, denying the CPCN will adversely impact the ability of Brightsource to move forward because it creates uncertainty as to how and if Brightsource will be able to interconnect thus putting at risk the commercial arrangements between Brightsource and DOE which are largely contingent on the timely approval of EITP.

DRA supports the PD denying the application and opposes the APD. DRA supports the approach taken in the PD, in particular agreeing that because there may be sufficient capacity on existing transmission systems in the region to deliver energy from the Brightsource project it is unnecessary and premature to

grant the CPCN for EITP. DRA also argues that the other projects with approved PPAs and the potential in the region is too uncertain to be used to justify the line or meet the criteria established for making a need determination pursuant to § 399.2.5.

DRA goes on to argue that because, in its view, the necessity of the line to deliver renewable energy pursuant to the first two prongs of the three prong test is suspect, the requirement that the costs of the line be reasonably balanced against the potential to achieve economically rational RPS compliance cannot be met.

DRA also raises a number of technical concerns with the proposed project noting that no CAISO study has been performed on the EITP as a whole, and the system impact study that has been done is, in DRA's view, grossly flawed. They also note that CAISO has not approved the project as a whole, and lastly, DRA argues that there has been insufficient consideration of Alternatives, in particular, a westward path alternative.

In its comments, CBD agrees with the PD that the applicant has failed to demonstrate that the project is needed. In particular, CBD agrees with the PD's conclusion that because there may be sufficient transmission capacity on other transmission providers' systems to interconnect the "one permitted project and the one project with an approved PPA" there is insufficient basis to conclude that the project is needed. CBD presents information regarding the existing transmission facilities in the region and presents information indicating that there is substantial capacity on LADWP's system to interconnect resources. CBD also presents cost information regarding the relatively lower cost of interconnecting to LADWP's system than building EITP. CBD also argues that because the line cannot be guaranteed to only carry renewables, especially given

the, in CBD's view, highly speculative nature of renewable projects that would utilize EITP and the fact that SCE did not provide data on its compliance with the RPS, it should not be approved.

CBD also reiterates a number of arguments regarding the insufficiency of the Final EIR/EIS. Regarding the Peevey APD specifically, CBD argues that the APD is trying to have it both ways; accepting the approach taken in the EIR in which a number of projects were deemed too speculative to be included in the CEQA review, but viewing these same projects as sufficiently certain to warrant finding the line is needed in order to interconnect them. Western Watersheds Project focused on alleged deficiencies in the final environmental document.

Most of the arguments raised in comments are squarely addressed in the discussion above providing our rationale for approving this project. While a number of parties oppose approval on the grounds that the resource potential and the renewable projects that would interconnect to EITP are too speculative, we flatly disagree. The approved PPAs in the region combined with the projects in the CAISO queue and the resource potential identified in the region provide a compelling basis to determine that this line, when built, will interconnect a substantial amount of renewable energy that would otherwise go undelivered, and thus can play an instrumental role in achieving the state's renewable energy goals.

We also won't belabor the discussion regarding whether the potential availability of transmission capacity on other entities' systems provides a basis for rejecting the CPCN. As SCE as well as Brightsource and First Solar point out, denying a project on the grounds that there might be transmission capacity available on non-CAISO transmission systems introduces substantial uncertainty into the interconnection process by effectively requiring project developers to

pursue multiple interconnection requests with various transmission owners in a region. This approach also creates tremendous uncertainty for transmission owners, like SCE, which are subject to the CAISO tariffs in that there is not currently a means by which they can assess available capacity on other systems before submitting an application for a CPCN as they, CAISO, nor this Commission, have the authority or other means of facilitating the level of coordination this would require. Additionally, the information CBD provides in its comments regarding the availability and economics of transmission capacity on LADWP's system is new information and is not part of the evidentiary record in this proceeding.

DRA's arguments regarding the insufficiency of the CAISO impact studies do not provide a compelling basis to deny or postpone approval of the CPCN. Though we do not dispute the basic fact that the system impact studies conducted thus far evaluated the system impacts below the line's full proposed capacity for generator interconnection, we note that additional generation projects seeking to use the line in the future will need to undertake studies before being interconnected to ensure that doing so will not result in adverse system impacts, pursuant to CAISO Tariff Appendix Y –LGIP For Requests In A Queue Cluster Window.[122] This is a less than ideal approach in that such subsequent generator interconnections might require further upgrades somewhere on the network in order to maintain reliability and deliverability, affecting the economic and environmental consequences of the overall transmission project in ways not assessed in the limited interconnection studies that have been presented. Such

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[122] See CAISO Tariff Appendix Y,http://www.caiso.com/27c3/27c3ee0763210.pdf.

further assessment would appear to require some speculation regarding the specific nature of the generation projects that will ultimately use the line, but would provide valuable information for assessing the full transmission project. However, given urgent circumstances in the present case combined with evidence regarding further renewable resources and commercial activity in this area, suspending consideration of this line pending an additional system impact study that evaluates the potential impacts if the line is used to its full rated capacity will lead to unacceptable delays. We believe the approach taken here, coupled with the interconnection protocols to which projects seeking to use this line are subject, provide adequate safeguards to prevent adverse system impacts due to full subscription of the line's capacity while ensuring that the near term projects that will interconnect can do so safely and without negatively effecting grid reliability.

With respect to DRA's concerns regarding how CAISO approval of the line occurs, in general we agree that under ideal circumstances major projects like EITP would emerge from the CAISO's overall integrated Transmission Planning Process (TPP) which provides a more holistic and open forum, and a more transparent basis, to consider and compare the various transmission lines that could be built to access high-potential renewable resource areas. However, we also recognize the practical reality that the timing for that integrated process does not currently align well with the exigencies of developing the substantial initial round of renewable projects in the Ivanpah Valley Region, particularly given the availability and terms of federal funding like the DOE loan guarantees. In this case, a number of relatively advanced renewable projects have sought interconnection to SCE's system via the Large Generator Interconnect Procedures and the line is being proposed, and a CPCN being requested in response to those

interconnection requests but additionally recognizing that from an economic standpoint, the line should be efficiently sized to support an amount of renewable generation that we can realistically anticipate being developed in the region in the not-too-distant future, to avoid piecemeal infrastructure development. For these reasons we disagree with the DRA's position that we should wait for relevant action from the CAISO's TPP, or its proposed revised TPP (RTPP) before considering this project. We also note that DRA's contention, that the CAISO has not approved this line, is misleading. While the project did not come out of the TPP, CAISO did enter into Large Generator Interconnection agreements that require SCE to pursue EITP.

However, having said that, use of the narrower generator interconnection process to design and implicitly approve (when LGIAs are submitted to FERC) very large transmission projects costing hundreds of millions of dollars and sized well beyond current generator interconnection needs is not a desirable alternative to studying, planning and approving such projects through the more holistic, transparent and open TPP. This is especially true when we are seeing high cost estimates, when more such renewable generation-supporting projects are anticipated, and when we have already expressed support for competitive opportunities to develop such transmission.

With respect to DRA's concerns regarding the elimination of westward alternatives from consideration, we believe the appropriate forum for this issue was in the context of the EIR/EIS. The determination to exclude the westward alternative was made in that context and parties were given full opportunity to participate in that process. We do not believe we need to readdress the basis for the determination of which alternatives were carried forward here. Similarly, to the extent Western Watersheds Project raises concerns in its comments related to

the insufficiency of the EIR/EIS we believe those issues are addressed in the Final EIR/EIS which we certify in this decision, and do not need to be further addressed here.

Regarding CBD's argument that the projects the Commission relies on to justify a need determination for EITP should also be incorporated into the EIR/EIS, we are not persuaded. This argument implies that the standard for determining need under § 399.2.5 requires that the renewable projects that support such a finding be sufficiently advanced for inclusion as a connected action in the CEQA context. However, no such equivalency is required. For example, the substantial renewable resource potential of an area could reasonably serve as the basis to find that a given transmission project is necessary to facilitate economically rational development for achieving the goals of the RPS program consistent with § 399.2.5. In our view, including as connected actions various hypothetical projects that may emerge is not required in the CEQA review. These projects were not sufficiently advanced to merit inclusion in the EIR/EIS. In addition, CBD's reasoning ignores the fact that the EIR/EIS is developed in a dynamic environment which can change while the review is being conducted and finalized. Those projects that were sufficiently advanced at the time the scope and baselines were established for conducting the environmental review should be included in the EIR/EIS, however this represents a subset of the projects that may be considered in making a need determination pursuant to § 399.2.5. This is driven both by the relative breadth of what projects and resources are considered in making a need determination, under § 399.2.5, recognizing our desire to build transmission in a manner that anticipates future development, as well as the fact that our consideration of the CPCN necessarily occurs after a substantial amount of time has passed since the

EIR/EIS process was initiated. As result of this, projects that were not well-defined when the scope and baselines were set for the EIR/EIS have since become more defined. However, as a practical and legal matter we are not obligated to include these emerging projects in the EIR/EIS. To do so would lead to a potentially open-ended environmental review process. The EIR/EIS conducted for this project appropriately included those projects that were sufficiently advanced at the time to be incorporated into the environmental review. In contrast, the need determination under § 399.2.5 considered a much broader set of projects including those projects that were well-defined at the time the environmental review was initiated, those projects that have since that time become relatively more well defined, as well as projects that are less mature, but which still reflect and validate the extensive renewable resource potential in the area, as well as the commercial interest in developing that potential in the region.

12. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner and Regina M. DeAngelis is the assigned ALJ in this proceeding.

Findings of Fact

1. The Eldorado-Ivanpah Transmission Project is necessary to promote the safety, health, comfort, and convenience of the public.

2. The Eldorado-Ivanpah Transmission Project is a high-voltage, bulk transfer, transmission facility designed to serve multiple renewable projects in the Ivanpah Dry Lake region.

3. The transmission capacity on the CAISO system that is currently available to interconnect resources in the Ivanpah Dry Lake Area is approximately 80 MW.

4. As proposed, the Eldorado-Ivanpah Transmission Project would provide sufficient transfer capability to transmit up to 1,400 MW of renewable capacity.

5. At present there are four renewable energy projects, representing 717 MW of capacity, with Commission approved power purchase agreements that are seeking interconnection to the CAISO system in the Ivanpah Dry Lake Area.

6. These power purchase agreements were approved in part because of the role that deliveries from these projects are anticipated to play in the realization of the state's 20% RPS goals.

7. At present there are 6 projects representing 964 MW of capacity requesting interconnection to the Eldorado-Ivanpah Transmission Project CAISO interconnection queue.

8. RETI identified the Mountain Pass Competitive Renewable Energy Zone, which is located in the California portion of the Ivanpah Dry Lake Area, as having significant renewable potential, in excess of 950 MW of potential capacity.

9. The Renewable Energy Transmission Initiative also identified an additional 5,402 MW of renewable capacity in the Nevada Southwest.

10. In light of the limited existing available transmission capacity on SCE's system, absent the Eldorado-Ivanpah Transmission Project, the renewable generation projects with Commission approved power purchase agreements will not have a means to deliver their energy to load centers, and, as a result, would be subject to significant delay and risk of contract failure.

11. The Eldorado-Ivanpah Transmission Project may play an important role in the development of renewable resources in the Ivanpah Dry Lake Area beyond those projects with Commission approved power purchase agreements.

12. Once an interconnection request is submitted to the CAISO, numerous studies are required before an interconnection agreement can be reasonably executed.

13. The time between submission of an interconnection request and execution of and interconnection agreement takes approximately two years.

14. The cost of the Eldorado-Ivanpah Transmission Project is justified based upon the high degree of the certainty that the project is needed to ensure development of RPS-eligible resources in the Ivanpah Dry Lake Area.

15. The project alternatives considered in the Final EIR/EIS constitute a reasonable range of feasible alternatives, as required by the CEQA Guidelines.

16. The environmentally superior alternative for the Eldorado-Ivanpah Transmission Project as identified in the Final EIR is the applicant's proposed project.

17. The environmentally superior route poses less harm to the environment than do the other routes proposed by SCE and/or considered in the Final EIR/EIS, while still meeting the project objectives.

18. The proposed route includes no-cost and low-cost measures (within the meaning of D.93-11-013, and D.06-01-042) to reduce possible exposure to EMF.

19. SCE agrees to comply with the mitigation measures described in the Final EIR/EIS.

20. The Commission has reviewed and considered the information in the Final EIR/EIS before approving the project.

21. In determining whether to grant a CPCN for the proposed project, we have given express consideration to community values, recreational and park areas, historic and aesthetic values, and influence on the environment.

22. The Final EIR identifies significant environmental effects of approved route that can be mitigated or avoided such that they become not significant.

23. Specific findings with respect to all significant or potentially significant environmental effects of the project as proposed and of the various alternative routes studied in the Final EIR/EIS are set forth in Attachment B to this Decision, CEQA Findings of Fact. We adopt the CEQA Findings of Fact included in Attachment B as if fully set forth herein.

24. The environmental mitigation measures identified in the Final EIR/EIS, and set forth in detail in Attachment A to this Decision, are feasible and will avoid some of the significant environmental impacts that would otherwise result from the approved project.

25. The Mitigation Monitoring Plan set forth in Chapter 9 of the Final EIR/EIS conforms to the recommendations of the Final EIR/EIS for measures required to mitigate or avoid those environmental effects of the project that can be reduced or avoided.

26. Notwithstanding the adoption in this Decision of all feasible mitigation measures identified in the Final EIR/EIS, and set forth in detail in Attachment A, there are certain adverse environmental impacts of the project being approved in this decision that cannot mitigated to a less than significant level. The project's unavoidable adverse environmental impacts are acceptable in light of the substantial benefits the project provides, particularly its role in facilitating compliance with the state's Renewables Portfolio Standard and meeting the greenhouse gas mitigation goals pursuant to Assembly Bill 32, which constitute an overriding consideration warranting approval of the project, despite each and every unavoidable impact.

27. As the State's lead agency under CEQA, the Commission is required to monitor the implementation of mitigation measures adopted for this project to ensure full compliance with the provisions of the monitoring program.

28. The Commission will develop a detailed implementation program for the Mitigation Monitoring Plan. This program will be called the Mitigation Monitoring, Reporting and Compliance Program (MMRCP).

29. The Final EIR reflects the Commission's independent judgment and analysis.

Conclusions of Law

1. The Commission has jurisdiction over the proposed project pursuant to, inter alia, Pub. Util. Code §§ 399.25 and §§ 1001 et seq.

2. In order to award a certificate under § 1001, the Commission must find that the present or future public necessity require or will require construction of the line.

3. Section 399.2.5 authorizes the Commission to deem necessary those transmission facilities identified in applications if the proposed facilities are necessary to facilitate achievement of the State's renewable power goals.

4. Section 399.2.5 also provides a "backstop" cost mechanism allowing the utilities to recover through retail rates any prudently incurred costs that are not approved by the Federal Energy Regulatory Commission for recovery through transmission rates.

5. The Commission implemented the cost recovery provisions of § 399.2.5 in D.03-07-033 and in D.06-06-034.

6. Section 399.2.5 does not create a presumption of need and the authority under § 399.2.5 is only exercised *after* the Commission fully considers the requirements of §§ 1001-1013, including the analysis required by § 1002.

7. Section 399.2.5 recognizes that in order to achieve RPS goals, it may be necessary for the Commission to approve new transmission projects in anticipation of future renewable energy projects, and to provide additional assurances of recovery of reasonable construction costs.

8. Because § 399.2.5 exists in a broader statutory context – one that requires ambitious renewable portfolio development, reasonable rates, and environmental protection -- we interpret this code section in a manner that strikes a reasonable balance.

9. In D.06-06-034 we identified two types of transmission projects that could be needed to facilitate RPS compliance and were therefore eligible for cost recovery. Those projects included "high-voltage, bulk-transfer, multi-user transmission facilities… proposed to access known, concentrated renewable resource areas…"

10. D.06-06-034 also noted that the degree of certainty required for a showing of RPS need "will depend on the magnitude of costs at stake," and that "in certain cases it will be necessary to consider the status of the RPS compliance to date…"

11. In order to rely on § 399.2.5 to establish the need for a project, we find that a proponent must demonstrate: (1) that a project would bring to the grid renewable generation that would otherwise remain unavailable; (2) that the area within the line's reach would play a critical role in meeting the RPS goals; and (3) that the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance.

12. The Eldorado-Ivanpah Transmission Project satisfies the requirements of Pub. Util. Code § 399.2.5.

13. The Commission retains authority to approve SCE's EMF mitigation plan to ensure that it does not create other adverse environmental impacts.

14. The Final EIR/EIS should be approved.

15. Project approval should be conditioned upon the completion of the mitigation measures set forth in Attachment A. These mitigation measures are feasible and will minimize or avoid significant environmental impacts. Those mitigation measures should be adopted and made conditions of project approval.

16. After considering and weighing the values of the community, the impacts to parks and recreational areas, the impacts on historical and aesthetic values, and the environmental impacts caused by the project, we conclude that the CPCN for the Eldorado-Ivanpah Transmission Project as described in this decision should be approved.

17. The Commission is the Lead Agency for compliance with the provisions of CEQA.

18. The Draft EIR/EIS analyzing the environmental impacts of the Proposed Project was processed in compliance with CEQA.

19. A Final EIR/EIS on the Proposed Project was processed and completed in compliance with the requirements of CEQA.

20. The Draft EIR/EIS and the Final EIR/EIS (which includes the Mitigation Monitoring, Reporting and Compliance Program and EMF Field Management Plan) should be adopted in their entirety.

21. SCE should be granted CPCN for the proposed route of the Eldorado-Ivanpah Transmission Project, with mitigation set forth in the Mitigation Monitoring Plan.

22. SCE should obtain all necessary permits, easement rights or other legal authority for the project site prior to commencing construction.

23. Possible exposure to EMF has been reduced by the no-cost and low-cost measures SCE will include in the project that are specified in Appendix B of its Application and pursuant to D.93-11-013, and D.06-01-042.

24. SCE's EMF management plan for the Eldorado-Ivanpah Transmission Project is adopted.

25. Based on the completed record before us, we conclude that other alternatives identified in the Final EIR/EIS are infeasible or and/pose more significant environmental impacts than the route we select in this decision.

26. Section 399.2.5(b)(4) ensures retail rate recovery of prudently-incurred costs for projects the Commission finds to be necessary to facilitate RPS compliance to the extent that cost recovery is not otherwise available.

27. The determinations made in D.06-06-034 regarding implementation of the cost recovery provisions of § 399.2.5 apply here.

28. Section 399.2.5 requires the Commission to direct SCE to seek the recovery through general transmission rates of the costs associated with the transmission facilities.

29. Section 399.25 is not meant to substitute for the existing cost recovery mechanisms available to support transmission development, nor is it intended to change the ultimate cost responsibility of generators and utility ratepayers. Nothing in this decision is intended to relieve renewable generators from their responsibility for their fair share of the costs of non-network transmission facilities necessary to interconnect the generator with the network.

30. Notwithstanding the likelihood of cost recovery through FERC wholesale rates, it is appropriate for SCE to continue to track its project costs through the

memorandum account approved by the Commission on December 17, 2009 in response to SCE Advice Letter 2345-E on December 17, 2009.

31. Both § 399.2.5 and D.06-06-034 anticipate that first FERC would act, and that this Commission would step in only if FERC disallows recovery of some costs. Thus, any consideration of cost recovery by this Commission would only come after FERC had concluded its consideration of cost recovery for the project.

32. The Commission has authority to specify a "maximum cost determined to be reasonable and prudent" for the Eldorado-Ivanpah Transmission Project pursuant to Pub. Util. Code § 1005.5.

33. The Commission should approve a maximum reasonable and prudent cost cap under § 1005.5 of $306.338 million plus a 15% contingency for this project.

34. Commission approval of SCE's application, as modified herein, is in the public interest.

35. This order should be effective immediately so that construction of the project can begin.

36. Application 09-05-027 should be closed.

O R D E R

IT IS ORDERED that:

1. A Certificate of Public Convenience and Necessity is granted to Southern California Edison Company to construct the Eldorado-Ivanpah Transmission Project, following the environmentally superior route described in the Final Joint Environmental Impact Report/Environmental Impact Statement, including the Draft and the Final Joint Environmental Impact Report/Environmental Impact Statement Mitigation Monitoring Plan and the Electric and Magnetic Fields Field Management Plan.

2. Southern California Edison Company shall, as a condition of approval, comply with all applicably mitigation measures specified in the Final Environmental Impact Report/Environmental Impact Statement and as directed by the Commission's Executive Director or designee(s). Southern California Edison Company shall work with the Commission's Energy Division to create detailed maps for use in construction and mitigation monitoring.

3. The Mitigation Monitoring Plan included as part of the Final Environmental Impact Report is adopted.

4. Pursuant to Pub. Util. Code § 1005.5(a), the maximum cost cap (in 2009 dollars) determined to be reasonable and prudent for the Eldorado-Ivanpah Project, is $306.338 million plus a 15% contingency.

5. The Energy Division shall supervise and oversee construction of the project insofar as it relates to monitoring and enforcement of the mitigation measures described in the Final Joint Environmental Impact Report/Environmental Impact Statement in accordance with the Mitigation Monitoring Plan set forth in Chapter 9 of the Final Joint Environmental Impact Report/Environmental Impact Statement. The Energy Division may delegate its duties to one or more Commission staff members or outside staff. The Energy Division is authorized to employ staff independent of the Commission staff to carry out such functions, including, without limitation, the on-site environmental inspection, environmental monitoring, and environmental mitigation supervision of the construction of the project. Such staff may be individually qualified professional environmental monitors or may be employed by one or more firms or organizations. In monitoring the implementation of the environmental mitigation measures described in the Final Joint Environmental Impact Report/Environmental Impact Statement, the Energy Division shall

attribute the acts and omissions of Southern California Edison Company's employees, contractors, subcontractors, or other agents to Southern California Edison Company. Southern California Edison Company shall comply with all orders and directives of the Energy Division concerning implementation of the environmental mitigation measures described in the Joint Environmental Impact Report/Environmental Impact Statement.

6. The Energy Division shall supervise and oversee the construction of the Eldorado-Ivanpah Transmission Project insofar as it relates to monitoring and enforcement of the mitigation measures described in the Final Environmental Impact Report/Environmental Impact Statement. The Energy Division may designate outside staff to perform on-site monitoring tasks. The Commission project manager (Energy Division, Environmental Projects Unit) shall have the authority to issue a Stop Work Order on the entire project, or portions thereof, for the purpose of ensuring compliance with the mitigation measures described in the Final Environmental Impact Report/Environmental Impact Statement. Construction may not resume without a Notice to Proceed issued by the Environmental Projects Unit of the Energy Division.

7. Southern California Edison Company's right to construct the Eldorado-Ivanpah Transmission Project as set forth in this decision shall be subject to all other necessary state and local permitting processes and approvals.

8. Southern California Edison Company shall file a written notice with the Commission, served on all parties to this proceeding, of its agreement, executed by an officer of Southern California Edison Company duly authorized (as evidenced by a resolution of its board of directors duly authenticated by a secretary or assistant secretary of Southern California Edison Company) to acknowledge Southern California Edison Company's acceptance of the

conditions set forth in the Ordering Paragraphs of this decision. Failure to file such notice within 75 days of the effective date of this decision shall result in the lapse of the authority granted by this decision.

9. Consistent with Pub. Util. Code § 399.2.5, the Commission shall ensure that Southern California Edison Company is eligible to recover, through rates, any reasonable and prudent costs related to the Eldorado-Ivanpah Transmission Project that the Federal Energy Regulatory Commission determines not to reflect in authorized transmission rates. Southern California Edison Company shall account for these costs, and seek any needed future recovery, in the manner described in Section 4.4.2 of this decision.

10. The Final Environmental Impact Report/Environmental Impact Statement for the Eldorado-Ivanpah Transmission Project is certified pursuant to the requirements of the California Environmental Quality Act, Public Resources Code §§ 21000 et seq.

11. The Draft Environmental Impact Report/Environmental Statement and the Final Environmental Impact Report/Environmental Statement are received into evidence. These documents are Exhibits ALJ-1 and 2 respectively.

12. The Energy Division shall file a Notice of Determination for the project as required by the California Environmental Quality Act and the regulations promulgated pursuant thereto.

13. Upon satisfactory completion of the project, Southern California Edison Company shall file a notice of completion with the Executive Director by the Energy Division.

14. Application 09-05-027 is closed.

This order is effective today.

Dated December 16, 2010, at San Francisco, California.

MICHAEL R. PEEVEY
President
DIAN M. GRUENEICH
JOHN A. BOHN
TIMOTHY ALAN SIMON
NANCY E. RYAN
Commissioners

Eldorado-Ivanpah Transmission Project

Incidental Take Permit
Permit 2081

SOUTHERN CALIFORNIA EDISON
ELDORADO-IVANPAH TRANSMISSION PROJECT
(Segments and Elements in California)

APPLICATION FOR INCIDENTAL TAKE OF ENDANGERED SPECIES
SECTION 2081
Per the California Endangered Species Act

IN ACCORDANCE WITH CALIFORNIA CODE OF REGULATIONS, TITLE 14, DIVISION 1, SUBDIVISION 3, CHAPTER 6, ARTICLE 1, SECTION 783.2

Prepared for:

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MAY 13, 2011

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2 Southern California Edison (SCE) 2010. Eldorado-Ivanpah Transmission Project, Eldorado Substation, Nevada to Ivanpah Substation, California, Biological Assessment
3 Karl, Alice E. 2010. Draft Southern California Edison Eldorado-Ivanpah Transmission Line Project Desert Tortoise Surveys. Prepared by Alice E. Karl, Ph.D. Prepared for Environmental Planning Group, Inc., January 2010.
4 Environmental Planning Group, Inc. (EPG) 2010. Draft Southern California Edison Eldorado-Ivanpah Transmission Project, 2010 Desert Tortoise Survey Report
5 SCE, 2010. Draft Eldorado-Ivanpah Transmission Project Raven Management Plan, October 2010.
6 SCE, 2011. Eldorado to Ivanpah Transmission Project Reclamation, Restoration and Revegetation Plan. May 2011.
7 CDFG 2010 Environmental Filing Fee Cash Receipt
8 CEQA Notice of Determination (Decision Granting a Certificate of Public Convenience)
9 Wildlands Inc. - Statement of Qualifications / Brochure

1.0 APPLICANT INFORMATION

Applicant:	Southern California Edison
Name and Title of Principal Officer:	Cecil R. House Senior Vice President Safety, Ops Support & Chief Procurement Officer
Contact Person:	Jack Goldfarb, Project Biologist 626-862-5087
Mailing Address:	1218 South Fifth Avenue Monrovia, California 91016

2.0 SPECIES COVERED BY THE PERMIT

The common and scientific names of the species to be covered by the permit and the species' status under the California Endangered Species Act (CESA), including whether the species is the subject of rules and guidelines pursuant to Sections 2112 and 2114 of the Fish and Game Code, are as follows:

Species:	Desert Tortoise, Mojave Population (*Gopherus agassizii*)
CESA Status:	Threatened

Desert tortoise is not the subject of rules and guidelines associated with any known recovery strategies being considered, designed, or implemented by the California Department of Fish and Game (CDFG) pursuant to Section 2105 - 2116 of the Fish and Game Code (the Recovery Strategy Pilot Program).

3.0 DESCRIPTION OF THE PROJECT OR ACTIVITY FOR WHICH THE PERMIT IS SOUGHT

The Eldorado-Ivanpah Transmission Project (EITP or Proposed Project) involves transmission upgrades to connect renewable energy anticipated to be generated in the Ivanpah Valley area to the transmission grid controlled by the California Independent Service Operator (CAISO). The Proposed Project includes the construction of the 220/115-kilovolt (kV) Ivanpah Substation, the replacement of approximately 35 miles of existing 115-kV line with a double-circuit 220-kV

transmission line between the existing Eldorado Substation and the Ivanpah Dry Lake area, and installation of a telecommunication system along two separate and redundant pathways (Figure 1, Vicinity Map). One circuit for the telecommunications system would be strung along the upgraded 220-kV transmission line. The second telecommunications path would be strung along the existing 500-kV Eldorado-Lugo transmission line over approximately 25 miles from the Eldorado substation to Route 164 where it turns west and would be installed in a new underground duct for approximately 5 miles on the north edge of the road leading to a new microwave tower outside Nipton, California. The new tower would transmit and receive line-of-site signals to and from the other proposed microwave tower to be located at the new Ivanpah substation.

In California, the EITP transmission alignment extends approximately 6.1 miles from Primm, Nevada to the proposed Ivanpah substation (Figure 1). 3.7 miles of this transmission line segment traverses potentially suitable habitat for desert tortoise (Figure 2). The remainder of the segment passes through disturbed areas and the Ivanpah Dry Lake bed, which are not suitable desert tortoise habitat (Karl 2010). The second telecommunication line extends 2.5 miles from the Nevada border within the Nipton Road right-of way (ROW) and then proceeds north 0.6 mile to the proposed microwave tower site.

The Biological Assessment prepared by SCE (Appendix 2, SCE 2010a) provides a comprehensive description of the Proposed Project with extensive details of all project components, including the main transmission line, subtransmission and distribution lines, the Ivanpah substation and the telecommunication system.

Site preparation and construction of the EITP will involve the use of different types of equipment and vehicles to perform various activities such as road clearing and grading, dismantling and removal of existing facilities, moving equipment and material, and installing project components. Helicopters will deliver material and accomplish certain construction activities such as wire stringing in less accessible areas. Tensioning, pulling, and splicing equipment would also be used to perform wire stringing operations.

After construction is completed, the Proposed Project will also involve operations and maintenance efforts such as routine line patrols, insulator washing, and maintaining anti-climbing guards, repairing or replacing poles and towers and re-stringing conductors. Periodically, weed control and road maintenance will be required and emergency repairs may be necessary if damage occurs from high winds, wildfires or other natural events or accidents.

The Proposed Project is anticipated to impact potentially suitable habitat for desert tortoise in California as set forth in Table 1, below, which is derived from the impacts analysis presented in the Biological Assessment (Appendix 2). Table 1 lists both permanent and temporary impacts related to the three major elements of the Proposed Project and based on whether project impacts may occur in federally designated critical habitat or non-critical habitat areas. As shown in

Table 1, the total tortoise habitat impacts include approximately 51.7 acres in California. Appendix 1 provides a detailed table of tortoise habitat impacts for all EITP components.

Figure 1 Vicinity Map

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Figure 2 2008, 2009 and 2010 Desert Tortoise Survey Data

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Table 1

New Habitat Disturbance to Designated Critical Habitat and Non-Critical Habitat for Desert Tortoise in California

Desert Tortoise Habitat	Telecommunication Route			Transmission Line Route			Project Total		
	Temporary Impacts (Acres)	*Permanent Impacts (Acres)*	*Subtotal (Acres)*	*Temporary Impacts (Acres)*	*Permanent Impacts (Acres)*	*Subtotal (Acres)*	*Temporary Impacts (Acres)*	*Permanent Impacts (Acres)*	*Total Impacts (Acres)*
Designated Critical Habitat	1.78	0.23	2.01	0.0	0.0	0.0	1.78	0.23	2.01
Non-Designated Habitat	0.02	0.0	0.02	43.7	6.0	49.7	43.7	6.0	49.7
Total	**1.8**	**0.23**	**2.03**	**43.7**	**6.0**	**49.7**	**45.5**	**6.23**	**51.7**

4.0 LOCATION WHERE THE PROJECT OR ACTIVITY IS TO OCCUR OR TO BE CONDUCTED

The Proposed Project area in California lies within the Ivanpah Valley in southeastern California, in San Bernardino County (Figure 1, Vicinity Map). The entire Proposed Project area is located within the Mojave Desert scrub biome, as described by Turner (1982). The Mojave Desert is characterized by abrupt mountain ranges, generally of moderate height, surrounded by aprons of low-profile bajada slopes, which drain to interior closed basins. Elevations within the California Project area corridor vary from approximately 2,600 feet above mean sea level (AMSL) in Ivanpah Dry Lake to a high point in the Nipton area of approximately 3,050 feet AMSL.

In California the Proposed Project elements are located on the U.S. Geological Survey (USGS) 7.5' Ivanpah Lake quadrangle map, spanning Sections 3, 4, Township 16N Range 14E; Sections 34, 35, 26, 25, 24 Township 17N Range 14E; and Sections 19, 18, and 17, Township 17N, Range 14E.

In Nevada, the Proposed Project elements are located on the following USGS 7.5' quadrangle maps: Desert, Roach, McCullough Pass, Hidden Valley, Sloan SE, and Boulder City SW, spanning Townships 25S through 27S, and Ranges 59E, through 62E.

Proposed Project locations within California include:

a. The Transmission portion of the Proposed Project is near the I-15 freeway corridor and crosses from Primm, Nevada into California near the freeway heading southwest. The transmission line crosses through Ivanpah Dry Lake to a point approximately 2.7 miles west of the Yates Well Road off-ramp from I-15 where the Ivanpah substation would be constructed.

b. The Telecommunications portion of the Proposed Project heads south from the Eldorado Valley in Clark County Nevada and proceed just east of the McCullough Range to Nevada State Route 164. The telecommunications line follows the road ROW of Route 164, into San Bernardino County, California where the road becomes Nipton Road. The telecommunication line continues to Nipton, California where it then turns north from the road for less than one mile. This general area lies about 10 miles southeast of the I-15 corridor.

5.0 POTENTIAL FOR PROJECT TO RESULT INTAKE OF COVERED SPECIES

The desert tortoise is the only state-listed species that would be affected by the Proposed Project. The State of California listed the Mojave population of the desert tortoise as threatened (CDFG 2008). More details regarding the EITP desert tortoise surveys are included in the attached desert tortoise reports representing three years of study: Karl (2010, Appendix 3) and EPG (2010, Appendix 4).

The elements of the Proposed Project located in California occur in habitat where desert tortoise sign (i.e., burrows, scat, tracks) was found, as shown in Figure 2, although no live tortoises were observed. Intensive analysis of a project adjacent to the EITP indicates that the tortoise density may be estimated at 1.4 desert tortoises per square kilometer (SCE 2010a). The Proposed Project area within California has an impact area of approximately 0.2 square kilometers (51.7 acres), as detailed in Appendix 1 for all EITP components and summarized in Table 1, above. This would imply that this loss or disturbance of habitat could involve a theoretical calculated take of about 0.3 tortoises within the impact area. However, this theoretical calculation is simply based on average tortoise density in the area and is not necessarily representative of how many tortoises could be encountered during Project activities, which are linear in nature; see paragraph below for a more detailed analysis.

Given the potential for desert tortoise to occur in the Proposed Project area and using the tortoise density estimate above, the analysis of potential Project take should also recognize that individuals outside of the Proposed Project area could cross into the Proposed Project alignment to forage. Based on Charis (2003), an average home range for a tortoise can be approximately 43.5 acres to 111.6 acres for female and male tortoises respectively; an average of this range could be about 77.5 acres in large sample sizes of tortoises in non-drought years. Assuming that ranges are circular, the approximate radius would be 0.316 km (1,037 feet). To account for tortoise coming in from either side of the linear alignment (from the north or south), the area to be considered must include the radius of the home range. The total area to consider would increase by twice the radius, or 0.632 km, to account for both sides of the Proposed Project alignment. In California, the length of the Proposed Project alignment where tortoise may cross into the Project area is approximately 6.9 km (4.3 miles = 3.7 miles + 0.6 mile, see Section 3 above). The width is 0.061 km (200 feet ROW) + 0.632 km = 0.693 km. The total area would be 6.9 km x 0.693 = 4.78 km^2. An estimate of the animals that could be found within the EITP Project area within California would be 4.78 km^2 x 1.4 animals/km^2 = 6.69; therefore it is reasonable to estimate that up to 7 individuals could be encountered within the Proposed Project area during Project construction activities in California.

The entire Proposed Project area is within the range of the species, and most of the area provides suitable habitat for tortoises with the exception of the lake bed of Ivanpah Dry Lake, which is not considered suitable habitat. The California segment of the project's transmission alignment does not pass through any federally designated (ESA) Critical Habitat for the Desert Tortoise. However, the alignment of the telecommunications optical ground wire (OPGW) cable associated with the Nipton 33kV distribution line east of Interstate 15 lies entirely within Desert Tortoise Critical Habitat in the Ivanpah Recovery Unit (Appendix 2, BA (SCE 2010a), Figure 2). The length of this segment in California within the Nipton Road ROW is approximately 2.5 miles. As depicted on Figure 2, from Nipton the OPGW cable will diverge from the road and cross through tortoise habitat as it proceeds north to the microwave tower site located approximately 0.6 mile north of Nipton Road. Placement of the OPGW cable will involve trenching along the road (Appendix 1, Table 1.2 - Path 2 - Section 2 Impacts) and the placement of wooden poles from the road to the microwave tower (Appendix 1, Table 1.3 - Distribution Line to Nipton Microwave Site Impacts).

Project surveys to assess habitat suitability for desert tortoise and to determine if they are presence or absent within the Proposed Project area were conducted over the course of three consecutive years by Alice E. Karl, Ph.D. in Nevada and California (Karl 2010, EPG 2010). In 2008, surveys were completed between May 13 and 23, inclusive. In 2009, surveys were conducted between May 14 and 29, inclusive; additional surveys on some spur and access roads were conducted on November 2, 2009. In 2010, surveys were conducted between April 4 and 10, inclusive. Pedestrian transects were completed consistent with the U.S. Fish and Wildlife Service (USFWS) protocol of 1992. The 1992 protocols were used in 2008 and 2009, and were also used in 2010 for consistency, even though the USFWS had established a new set of protocols in 2009 (USFWS 2009).

Due to the variety of components surveyed, variations in the above methods were applied to ensure a comprehensive survey. Only the results for surveys of the California Project elements are described below; see Figure 2, and see detailed information provided in Section 3, above, regarding Project component details.

The Proposed Route assumed a 200-foot-wide ROW (seven, 30-foot-wide transects) for the 2008 surveys. Zone of Influence (ZOI) transects were completed on the route in 2008 from Eldorado Substation in Nevada to slightly past the proposed Ivanpah Substation site in California. In 2009, the remaining ZOI transects were completed.

Tortoise sign was observed along the transmission line and telecommunication line (except for Ivanpah Dry Lake), as shown in Figure 2. In 2008 and 2009, a total of 12 tortoise sign was observed along the proposed ROW (observations within the 200 feet wide ROW), although no live tortoises were observed in the California portion of the Proposed Project area. Observations included 6 burrows, 5 scat, and 1 other type of sign (e.g., tracks,

drinking depressions), but no carcasses or shell parts (Figure 2). In California most of the sign was observed in the Nipton area (Appendix 3, Figure 2, Karl 2010).

An approximate desert tortoise density for the transmission line component in the Proposed Project area was calculated using the 100% coverage tortoise survey data from 2008 and 2009 (Appendix 3: Desert Tortoise Surveys [Karl 2010]) with the tortoise density calculator in the USFWS 2009 Desert Tortoise Pre-project Survey Guidance document. The tortoise density calculator uses only live tortoise records (those $\geq$ 160mm carapace length), and live tortoises located within the project 100% survey coverage areas. Because no live tortoises were observed in the California portion of the Proposed Project impact area, which is approximately 51.7 acres (0.21 km^2), tortoise density for the remaining project elements could not be estimated using the USFWS calculator. However, extensive desert tortoise surveys were also done for the proposed Ivanpah Solar Electric Generating System (ISEGS) Project (located adjacent to part of the EITP in California), and density in this was estimated to be 1.4 tortoises per sq. km (SCE 2010a). However, the presence of tortoise sign, including burrows, scats, and other indicators, provides confirmation of the use of project elements by desert tortoises. Therefore, as described above, the tortoise density estimated for the ISEGS project was also applied to the Proposed Project area, with the modification to recognize and account for tortoise movement across the transmission alignment.

In summary, it is estimated that approximately 7 individual desert tortoises could be encountered within the Proposed Project area during construction activities. However, implementation of mitigation measures described in Section 8 below would substantially reduce the chance of actual injury of individuals. In terms of temporary or permanent loss of habitat, as noted above, and as described in Section 6 below, the Proposed Project would impact 51.7 acres of desert tortoise habitat.

6.0 IMPACT ANALYSIS OF PROPOSED TAKING OF THE SPECIES

Direct Effects on Habitat and Individuals

The Proposed Project would result in temporary and permanent direct effects to approximately 51.7 acres of desert tortoise habitat and has the potential to directly affect desert tortoise individuals, including harassment, injury and/or mortality (Appendix 2: Biological Assessment - Section 4.1 [SCE 2010a]). It was estimated in Section 5 above that approximately 7 individual tortoises could be encountered during construction

activities, but the avoidance and minimization measures discussed below in Section 8 would substantially reduce the chance of actual injury of individuals.

Transmission Impacts

As summarized in Table 2, the construction of the transmission portion of the EITP in California would involve temporary and permanent impacts to approximately 49.7 acres of desert tortoise habitat, of which 43.7 acres would be temporary impacts. These impacts were calculated using impact estimates from Tables 2-11 and 2-12 of the EITP Final EIR/EIS (SCE 2010a) and then refined using preliminary engineering information using GIS analysis within California. The following Project elements were included in impacts: 115-kV transmission tower and conductor removal work areas; new 115-kV subtransmission pole installation areas; 220-kV tower construction work areas; 220kV conductor pulling, splicing, and tensioning sites; tower fabrication areas. Permanent impacts include the 220kV tower sites, clearance areas around the 220-kV towers, new access and spur road grading, new subtransmission facilities, and the distribution line loop-in.

Telecommunication Impacts

The construction of the telecommunication route would result in impacts to approximately 2.0 acres of desert tortoise habitat in California, of which 1.8 acres would be temporary impacts. The temporary impacts would occur due to construction activities and are calculated using impact estimates from Table 2-14 of the EITP Final EIR/EIS (SCE 2010b) and refined for the Biological Assessment (SCE 2010a) using preliminary engineering information within California. Project elements resulting in temporary impacts include the underground OPGW installation, the work areas for pulling and tensioning and for installing wood poles for power distribution to the Nipton microwave site. Permanent impacts include the OPGW vaults north of Nipton, the microwave tower site itself, and the power poles themselves.

Direct effects to desert tortoise, including harassment, injury, and/or mortality could occur during Project construction activities for any of the following reasons:

- Vehicular Traffic. Direct mortality of tortoises by construction traffic on access roads or tower spurs could occur. During the construction period, there would be heavy traffic, including small and large trucks, water trucks, bulldozers, and other construction vehicles on access and spur roads, tower sites, pulling and tensioning sites. Any tortoise in these areas during construction hours would be highly vulnerable to direct effects. This could be aggravated by the introduction of water

not normally available to tortoises, which may be present on the Project site for dust control or cleaning of equipment related to noxious weed mitigation.

- Grading and Construction Equipment. Equipment used to create new spur roads and to create tower pads could crush tortoises, or collapse both occupied and unoccupied burrows. Open excavations for tower foundations or trenches for underground fiber optic installation may create a trap hazard for tortoises.
- Human Presence (food and litter). The presence of human activity in the Project area during construction could attract the most important native predators of the desert tortoise: the common raven (*Corvus corax*) and coyote (*Canis latrans*). These predators are attracted to human-related food and water sources.
- Construction Debris, Chemicals. Construction debris and hazardous materials spills, such as antifreeze or petroleum products, and herbicides used for weed control that could be ingested by desert tortoises could have direct serious or fatal effects on individuals.
- Increased Fire Risk. Accidental fires associated with Project construction, such as those resulting from discarded smoking materials or equipment-induced fires, could be fatal to desert tortoises. Additional effects of accidental fires could include loss of forage, shelter and cover habitat for tortoises.
- Moving Animals. Handling of desert tortoises by the wildlife biologist during construction monitoring could cause temporary stress during movement of the tortoise from impact areas to a safe receptor site.

Indirect Effects on Habitat and Individuals

The Proposed Project may result in the following indirect effects on desert tortoise and its habitat both during the construction and over the long-term related to operation and maintenance:

- Dust, Chemical Residue. During construction, the health of desert tortoises may be adversely affected by fugitive dust; herbicides used for weed control which may affect tortoises indirectly through their food sources; and altered behavior resulting from construction activity in occupied habitat areas, including loss of water sources due to grading of depressions that temporarily capture water.
- Vegetation Removal. The construction of any new access roads, tower spurs, and clearing of pads for Lattice Steel Tower (LST) or pole construction would remove vegetation, which provides food and cover for tortoises. Removal of native vegetation may encourage the colonization and proliferation of invasive exotic

plant species, which may alter the native plant community, and adversely affect native forb diversity, abundance, and quality of desert tortoise forage. Invasive plant species could also reduce the quantity and quality of desert shrub shelter (burrows, pallets, temporary shade) locations on which the tortoises depend. Recurrent fires due to current presence of exotic plants can exacerbate this problem.

- Increased Raven Predation. LSTs provide potential perch and nesting sites for common ravens. Perches provided by structures could be used by ravens for hunting, and could increase predation on juvenile tortoises in the area. Ravens could build nests in structures and thereby increase their presence in the area, exacerbating effects to juvenile tortoises in the local population.
- Increased Human Access to Habitat. New access roads or tower spurs would increase access to tortoise habitat by private vehicles and off-highway vehicles (OHVs), which could result in harassment; crushing or collection of tortoises; collapse of burrows; compaction and erosion of soils; and proliferation of weeds, including grasses that can fuel wildfires. (Because there are several BLM permitted recreation events in the Jean/Roach Dry Lake area, which include competitive OHV races and other non-motorized specialized sport organized events, human activity is already high in the immediate vicinity of the Proposed Project. The existing utility roadways through the McCullough Range, including the North McCullough Pass, are already used for some of these recreational activities. In combination with these existing threats, the potential for effects to desert tortoises and their habitat from the construction of new access and tower spur roads contiguous with those already present, is probably higher here than in areas where a regular human presence is not a pre-existing condition.)
- Increase of Invasive Plants. Recurring accidental fires could provide habitat suitable for colonization by non-native invasive plant species, which could compete with native plant species of value to tortoise for forage and cover, and may over time alter the local plant community and associated fire regime.

7.0 INCIDENTAL TAKE PERMIT ANALYSIS

An analysis of whether issuance of the incidental take permit would jeopardize the continued existence of a species is described in detail below. This analysis includes consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (A) known population trends; (B) known threats to the species; and (C) reasonably foreseeable impacts on the species from other related projects and activities.

Known Population Trends

According the *Draft Revised Recovery Plan for the Mojave Population of the Desert Tortoise (Gopherus agassizii)*, the Mojave population occurs north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California (USFWS 2008). Historic information for the Mojave population densities or abundance does not exist to provide a baseline for population trends (USFWS 2008). Long-term study plots and other studies; however, suggest "appreciable declines" at the local level in many areas and that the identified downward trend of the species in the western portion of the range at the time of the federal listing as threatened in 1990 was valid and is ongoing (USFWS 2008). Results of studies in other parts of the Mojave population's range also are inconclusive, but suggest that declines are broadly distributed across the tortoise's Mojave Desert range (USFWS 2008). In addition, specific management actions over a 23-year monitoring program have not demonstrated a positive effect on populations, although the life history of the species (i.e., delayed reproductive maturity, low reproductive rates, and relatively high mortality early in life) is such that rapid increases in populations are unlikely to be observed (USFWS 2008).

Known Threats

Desert tortoises continue to face numerous threats that were identified in the 1994 Desert Tortoise Recovery Plan (USFWS 1994). Livestock grazing, recreational OHV use, military training activities, urban development, and increases in predation are some of the factors that affect tortoise survival (Lovich 2003). An upper respiratory tract disease is a major cause of mortality of desert tortoises (USFWS 2008). Predation of small tortoises by common ravens, which are associated with development and human activity, is a substantial threat (USFWS 2008). Additional threats are collection of tortoises for commercial sale as pets and food, and vandalism (shooting, crushing, or mutilation) (USFWS 1994).

The conservation measures identified in the EITP Final EIR/EIS (SCE 2010b), including Applicant Proposed Measures (APMs) and mitigation measures, including the desert tortoise-specific measures, will be implemented to reduce the adverse effects of the Proposed Project on the desert tortoise, as described in Section 2.1.4 of the BA (SCE 2010a). Even with implementation of these conservation measures, the Proposed Project is still likely to adversely affect the desert tortoise because the Proposed Project will result in the temporary loss or disturbance of up to 45.5 acres and the permanent loss of up to 6.2 acres of desert tortoise habitat in California.

The telecommunication line and microwave tower elements of the Proposed Project are located within the Ivanpah Valley Critical Habitat unit (632,343 acres) for desert tortoise. Approximately 2.01 acres of Critical Habitat would be impacted (Table 2), which amounts to only about 0.0003% of the total CH in this unit. Of the 2.01 acres of impacts, 1.78 acres would be temporary and 0.23 acre would be permanent. When evaluated against the entire combined total of 632,343 acres of the CH unit, the Proposed Project does not represent a quantitative or qualitative change to the status of this unit or the recovery of the desert tortoise populations in these units. Furthermore, most of the impacts in this area would occur within the ROW of Nipton Road, further reducing the potential adverse impacts to this species given the existing level of impacts associated with the roadway.

Issuing an incidental take permit for the EITP actions in California will not jeopardize the continued existence of the Mojave population of the desert tortoise. Impacts to the desert tortoise in California will be limited to project disturbances of potentially suitable habitat. EITP Final EIR/EIS APMs and mitigation measures, described in Section 8, will afford reasonable protection for individual specimens during construction. Compensatory mitigation is proposed to offset potential project impacts to the desert tortoise and its habitat. These impacts will consist of 2.01 acres of impacts to designated critical habitat and 49.7 acres of impacts to non-designated habitat in California (Tables 2 and 3). Taken together, these prescribed APMs and mitigation actions, subject to Department of Fish and Game acceptance, are considered sufficient to fully mitigate the adverse impacts of the EITP on the desert tortoise.

Reasonably Foreseeable Impacts From Other Related Projects and Activities

The Proposed Project impacts may combine with impacts from other related projects and activities. Theses cumulative biological effects are generally additive, and usually directly proportional to the amount of ground disturbed. Cumulative effects also depend, to some extent, on whether or not project construction activities are temporally concurrent or sequential in a given area. If construction is occurring concurrently, a higher volume of traffic may result and possibly greater amounts of ground disturbance would occur. Sequential activities, on the other hand, may create disturbance to biological resources, including wildlife, for a longer period of time, resulting in prolonged or permanent displacement of wildlife from crucial habitats. Where designated corridors are used, access roads may serve more than one line and would therefore minimize ground disturbance and limit the amount of new access required. This is predominantly the case for the Proposed Project, which will be accomplished within existing corridors and access roads.

An analysis of cumulative effects for the Proposed Project, which included the Nevada portion of the EITP, was provided in Section 5.0 of the PEA (Proponent's Environmental Assessment) prepared for the BLM by Environmental Planning Group (EPG), Inc. The geographic area that was used in the analysis of potential cumulative effects in the Proposed Project area includes the designated BLM utility corridor and the adjacent Eldorado and Ivanpah valleys. Impacts from the EITP project in Nevada and other projects in Nevada are included because state jurisdictional boundaries are not relevant to cumulative biological impacts.

The PEA identified 19 existing or approved actions and 24 pending actions in the Proposed Area vicinity. Eleven of these are wind energy projects, which due to siting requirements for turbines at higher elevations where the wind energy potential occurs, would have minimal potential effects on desert tortoises and their habitat. The remaining actions are primarily approved or proposed solar generating facilities, which due to their location in valley bottoms would have a greater potential for effects on desert tortoises and their habitat.

This discussion separately discusses projects with and without a federal nexus. Projects identified in the project PEA that do not have a federal nexus include four proposed solar energy facilities in the northern Eldorado Valley within the Boulder City, Nevada limits; two communication facilities; and one small mining operation. The four proposed solar sites would comprise a total of approximately 8,692 acres. The two communications facilities together comprise less than 0.1 acre. The mine site is 15 acres. The total acreage for all projects in the geographic analysis area that occur on private lands, without accounting for the Proposed Project, is approximately 8,707 acres. A total of 165.6 acres of the EITP would be built on private lands near Primm, Nevada, and at the existing Eldorado Substation. The 165.6 acres of private lands in Proposed Project area represent less than 2% of total private lands (approximately 8,873 acres) that are currently planned for development in the Eldorado and Ivanpah valleys. Much of the private land that will be utilized by the EITP has already been disturbed by development at Primm and the Eldorado Substation, resulting in areas that no longer contain suitable tortoise habitat.

Considering that the Proposed Project, including the Nevada portion, accounts for less than 2% of the cumulative impact on private lands and the low quality of desert tortoise habitat of the private lands that would be affected by the EITP, the Proposed Project would not substantially contribute to the 8,873 acres of cumulative effects of currently foreseen actions on private lands in the Eldorado and Ivanpah valleys.

Most of the projects identified in the PEA have a federal nexus, the cumulative effects of which were evaluated using the National Environmental Policy Act (NEPA) guidelines. These include projects proposed for development on BLM lands, the approved Ivanpah Valley Airport (Clark County), and modifications and improvements within the I-15

corridor by California Department of Transportation (CalTrans) and the Nevada Department of Transportation (NDOT).

Among the permitted land uses on BLM-administered lands are provisions to allow systems for generation, transmission, and distribution of electric energy (Federal Land Policy and Management Act of 1976). Approved projects in the Ivanpah Valley include the Ivanpah Valley Airport (approximately 5,863 acres), and several NDOT and CalTrans projects associated with improvements to I-15, including the commercial vehicle enforcement and agricultural inspection facilities in California. There are 13 pending solar energy facilities currently planned for the Ivanpah Valley, with a combined potential disturbance of approximately 89,000 acres. Pending solar projects in the Eldorado Valley include seven sites totaling approximately 19,400 acres. All approved and pending projects in the Proposed Project area vicinity within the Ivanpah and Eldorado valleys that could impact desert tortoise habitat comprise approximately 114,300 acres. Comparatively, the Proposed Project, including the Nevada portion of the Project, would directly impact approximately 426 acres of desert tortoise habitat (of which approximately 89 acres are in designated desert tortoise CH). This amounts to approximately 0.4% of the combined acreage of actual and proposed projects in the Eldorado and Ivanpah valleys with a federal nexus. Additionally, unlike projects that permanently convert land and therefore remove it from use by desert tortoise, transmission lines are permeable to desert tortoise movements and do not result in significant habitat fragmentation for this species. The Proposed Action will occur within existing ROWs that already contain a moderate level of disturbance and will affect only small areas of undisturbed desert. New disturbance is primarily associated with new tower site access in some areas.

Considering that the Proposed Project, including the Nevada portion of the Project, accounts for about 0.4% of the cumulative impacts of projects with a federal nexus, the Proposed Project would not substantially contribute to the cumulative effects of currently foreseen actions on lands with a federal nexus.

8.0 PROPOSED MEASURES TO MINIMIZE AND FULLY MITIGATE IMPACTS OF THE PROPOSED TAKING

8.1 On-Site Mitigation - Impact Avoidance & Minimization

SCE will implement various Applicant Proposed Measures (APMs, as listed in Chapter 9.0 Mitigation Monitoring Plan in the EITP Final EIR/EIS) to effectively reduce the Proposed Project's potential adverse effects on the desert tortoise. The relevant APM's for the EITP include:

- (APM BIO-1) Performing preconstruction surveys
- (APM BIO-2) Minimizing vegetation impacts
- (APM BIO-4) Implementing Best Management Practices
- (APM BIO-5) Employing qualified biological resources monitors to assure resource protection during construction
- (APM BIO-6) Requiring environmental awareness training for construction personnel
- (APM BIO-9) Adjusting tower and spur road siting and configurations to avoid sensitive resources where feasible.

These APMs will be implemented to avoid and minimize impacts to all special-status species and biological resources, including desert tortoise.

In addition to the foregoing general APMs to avoid impacts on special-status species, including tortoise, as described in APM BIO-11 of the EITP Final EIR/EIS, the applicant or a qualified consultant will provide for the following to specifically reduce impacts on desert tortoise:

- **WEAP Training.** All construction personnel, including subcontractors, will complete a Worker Environmental Awareness Program (WEAP). This instruction will include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by state and federal endangered species acts.
- **Valid Permits Issued.** The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the CDFG 2081 permit, and NDOW authorization. Additionally, compliance discussions with Clark County and Boulder City must occur prior to construction that resolve and outline the specific compensation fees and additional mitigation measures needed for loss of desert tortoise habitat in Nevada. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided to the CPUC.
- **Field Contact Representative.** A field contact representative (FCR) will be designated and will oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The field contact representative would also oversee all compliance

documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion.

- **Mark Limits of Work.** All work area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers will strictly limit activities and vehicles to the designated work areas.
- **Avoid Removing Vegetation.** Crushing/ Removal of perennial, native vegetation in work areas will be avoided to the maximum extent practicable, particularly while accessing pulling and splicing stations and during pulling and splicing activities. Access to work areas in undisturbed habitat will be achieved by crushing, instead of removal, to the maximum extent practicable.
- **Litter Control.** All trash and food items generated by construction and maintenance activities will be promptly contained and regularly removed from the project site(s) to reduce the attractiveness of the area to common ravens.
- **No Pets Allowed.** Pets will not be allowed in working areas.
- **No Off-Road Access.** Where possible, motor vehicles will be limited to maintained roads and designated routes.
- **Speed Limit.** Vehicle speed within the project area, along ROW maintenance routes, and along existing access roads will not exceed 20 miles per hour. Speed limits will be clearly marked and all workers made aware of these limits.
- **Low Roadside Berms (Passable by Tortoise).** Constructed road berms will be less than 12 inches in height and have slopes of less than 30 degrees.
- **Qualified Biological Monitors.** Construction monitoring will employ a designated field contact representative, authorized biologist(s), and qualified biologist(s) approved by the BLM during the construction phase. At a minimum, qualified biologist(s) will be present during all activities in which encounters with tortoises could occur. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized biologist is defined as a wildlife biologist who has been authorized to handle desert tortoises by the USFWS. A field contact representative is defined as a person designated by the project proponent who is responsible for overseeing compliance with desert tortoise protective measures and for coordination with agency compliance officer(s).
- **Preconstruction Clearance Surveys.** Preconstruction clearance surveys would be conducted within 48 hours of initiation of site-specific project activities, following

USFWS protocol. The goal of a clearance survey is to find all tortoises on the surface and in burrows that could be harmed by construction activities. Surveys will cover 100 percent of the acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity will be marked. Tortoise burrows will be avoided to the extent practicable, but will be excavated if they would be crushed by construction activities.

- **Relocate Tortoises (on Surface) Per Current Guidance.** Any tortoise found on the surface will be relocated to less than 1,000 feet away. Tortoises will be handled carefully following the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects. Tortoises will be handled with new latex gloves each time to avoid transmission of disease, and handlers will especially note guidelines for precautions to be taken during high-temperature periods.
- **Relocate Tortoises (in Burrows) Per Current Guidance.** If a potential tortoise burrow is required to be excavated, the biologist will proceed according to the guidelines given in Guidelines for Handling Desert Tortoise during Construction Projects. Tortoises removed from burrows will be relocated to an artificial burrow. The entrance of the artificial burrow would be blocked until construction activities in the area were over (Desert Tortoise Council 1994).
- **Monitoring During Construction.** For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises might occur will be monitored by a qualified or authorized biologist. The biologist will be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The qualified or authorized biologist will watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and conduct other activities to ensure that death or injuries of tortoises were minimized.
- **Trenches/Holes Covered or Fenced Daily.** No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) will be left unfenced or uncovered; such hazards will be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term project areas will be enclosed with tortoise-proof fencing. Fencing will be removed when restoration of the site is completed.
- **Non-Compliance Reporting Required.** Any incident occurring during project activities considered by the biological monitor not to be in compliance with the mitigation plan will be documented immediately by the biological monitor. The

field contact representative will ensure that appropriate corrective action is taken. Corrective actions will be documented by the monitor. The following incidents will require immediate cessation of the construction activities causing the incident, including (1) imminent threat of injury or death to a desert tortoise; (2) unauthorized handling of a desert tortoise, regardless of intent; (3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and (4) conducting any construction activity without a biological monitor where one was required. If the monitor and field contact representative do not agree, the federal agency's compliance officer will be contacted for resolution. All parties may refer the resolution to the federal agency's authorized officer.

- **Construction Monitoring Reports.** Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed.
- **Look Under Parked Vehicles Before Operating.** Parked vehicles will be inspected prior to being moved. If a tortoise is found beneath a vehicle, the authorized biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise left of its own accord. The authorized biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes that could be harmful to the animal.
- **Authority to Halt Activities.** Should any desert tortoise be injured or killed, all activities will be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist will be responsible for reporting the incident to the authorizing agencies.
- **All Incidents Reported.** A report to the CDFG will be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises will be reported.
- **Raven Management.** The applicant will implement a Raven Management Program (Appendix 5, SCE 2010c) that will consist of: (1) an annual survey to

identify raven nests on towers and any tortoise remains at tower locations; this information will be relayed to the BLM so that the ravens and/or their nests in these towers can be targeted for removal, (2) SCE making an annual or one time contribution to an overall raven reduction program in the California or Nevada desert, with an emphasis on raven removal in the vicinity of this project.

The applicant will also implement the following mitigation measures, which are incorporated in the Final EIR/EIS (SCE 2010b) for the EITP and are relevant to mitigation of adverse effects on desert tortoise and associated habitat. Some of the prescribed Mitigation Measures (MMs) described below overlap with, are supplemental to, and/or provide additional detail or guidance for implementing similar APM's listed above.

MM BIO-1 specifies that "preconstruction surveys will be conducted by USFWS-approved biologists according to the most current USFWS protocols…" and that surveys will be conducted in all brush clearing or ground disturbance areas within suitable habitat.

Further protection of desert tortoise during construction will also be afforded by implementing MM BIO-9 which requires covering any trenches, auger holes, or other excavations, providing escape ramps and twice-daily inspections of open trenches or other excavations a minimum and also specifies immediate back-filling. As required under APM BIO-5, MM BIO-10 also mandates that "biological monitors will be provided throughout construction activities in all construction zones with the potential for presence of sensitive biological resources. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use." Also, to avoid attracting tortoises, MM BIO-11 specifies that water must not be allowed to pool and requires attention and repair to leaks on water trucks.

Finally, specific measures established in the Final EIR/EIS for the EITP to reduce or compensate for impacts to desert tortoise are presented in MM BIO-12, included below in its entirety:

- **Valid Permits Issued.** The applicant cannot begin construction until issuance and acceptance of the USFWS Biological Opinion, the California Department of Fish and Game (CDFG) 2081 permit, and Nevada Department of Wildlife (NDOW) authorization. A copy of the USFWS Biological Opinion and documentation of any compliance discussions with Clark County and Boulder City will be provided

to the California Public Utilities Commission (CPUC) and the Clark County Desert Conservation Program.

- **Field Contact Representative Assigned.** Construction monitoring will employ a designated field contact representative (FCR), authorized biologist(s), and qualified biologist(s) approved by the USFWS, NDOW, and CDFG during the construction phase of the project. BLM will recommend qualified, authorized biologists to the USFWS and will approve all biological monitors.
- **Construction Monitoring.** Qualified and/or authorized biologists will monitor all construction activities year-round in desert tortoise habitat, regardless of the time of year or weather conditions, as tortoises are often active outside their "active" season.
- **Preconstruction Surveys.** Qualified and/or authorized biologists will conduct preconstruction surveys according to the most current USFWS protocol.
- **Employ Current Guidance for Handling Animals.** Authorized biologists will handle desert tortoises following the most current Desert Tortoise Council handling guidelines (2009 or newer).
- **Authorization Required to Relocate.** Prior to commencing desert tortoise relocation activities, authorization will be obtained from NDOW, CDFG, and USFWS. The authorized biologist will not be required to receive approval to move individual desert tortoises during construction.
- **Relocation Only to Safe Sites.** Desert tortoise relocations will only occur from an active construction zone to an area that is not under active construction by the EITP project or any other planned project.
- **Monitors Survey Before Construction Activity.** Biological monitors will clear ahead of construction crews in desert tortoise habitat during all clearing and grading activities, or during any activity where undisturbed vegetation would be crushed. In addition, biological monitors will clear ahead of larger, non-rubber-tired equipment when that equipment is being driven on access and spur roads.
- **Monitors Inspect Work Areas Daily Before Activity Proceeds.** Biological monitors will clear all active work sites located in desert tortoise habitat each morning before construction begins and throughout the day if crews move from construction site to construction site.
- **Monitoring Reports.** Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within 24 hours of any action that involves harm to a desert tortoise, or involves a blatant

disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed.

- **Handling Tortoises Prohibited Over 95°F.** No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95 degrees Fahrenheit (35 degrees Celsius). No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95 degrees Fahrenheit before handling or processing can be completed. If the ambient air temperature exceeds 95 degrees Fahrenheit during handling or processing, desert tortoises shall be kept shaded in an environment which does not exceed 95 degrees Fahrenheit, and the animals shall not be released until ambient air temperature declines to below 95 degrees Fahrenheit. For translocation, captured tortoises may be held overnight and moved the following morning within these temperature constraints.
- **Keep Tortoise Cool.** During all handling procedures, desert tortoises must be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (e.g., gaping, foaming at the mouth, hyperactivity, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises must be kept shaded at all times until it is safe to release them. Ambient air temperature must be measured in the shade, protected from wind, and at a height of 2 inches above the ground surface.
- **Rehydrate Tortoises.** If a desert tortoise voids its bladder as a result of being handled, the animal shall be rehydrated. The process of rehydrating a desert tortoise will take place at the location where the animal was captured (or to be released, for translocated tortoises), and consist of placing the desert tortoise in a tub with a clean plastic disposable liner. The amount of water that is placed in the lined tub shall not be higher than the lower jaw of the animal. Each desert tortoise shall be rehydrated for a minimum of 10 to 20 minutes. During the period when the desert tortoise is in the tub, the tub will be placed in a quiet protected area. Desert tortoises shall be soaked individually.
- **Care for Injured Tortoises.** If a desert tortoise is injured as a result of project-related activities, it shall be immediately taken to a CDFG-approved wildlife rehabilitation or veterinary facility. The applicant shall identify the facility prior to the start of ground- or vegetation-disturbing activities. The applicant shall bear any costs associated with the care or treatment of such injured covered species. The applicant shall notify CDFG of the injury immediately unless the incident occurs outside of

normal business hours. In that event CDFG shall be notified no later than noon on the next business day. Notification to CDFG shall be via telephone or email, followed by a written incident report. Notification shall include the date, time, location, and circumstances of the incident, and the name of the facility where the animal was taken.

- **Raven Management.** The applicant will produce a Raven Management Plan that is acceptable to the BLM and the CPUC. Details in the plan will include information on procedures, frequency, and recommended season for conducting raven nest surveys, procedures and responsibilities for raven nest removal, USFWS/NDOW/CDFG authorization and/or permitting requirements for conducting raven control, and compensation measures for raven reduction programs in California and Nevada. The plan will be submitted to the BLM and the CPUC at least 60 days prior to construction for review and approval.

The on-site mitigation efforts listed above to protect tortoises during construction and to provide for revegetation of temporarily disturbed areas will provide substantial mitigation for the Proposed Project's adverse effects on desert tortoise and provide considerable protection for individual specimens.

In addition to these on-site mitigation measures during construction, a Reclamation, Restoration, and Revegetation Plan (RRRP) will be implemented (Appendix 6) to meet the requirement of Mitigation Measure BIO-2 and APM-11 of the Final EIR/EIS. The RRRP guides restoration and revegetation activities for all naturally vegetated lands temporarily disturbed by construction of the Proposed Project and by the eventual termination and decommissioning of the Project. The RRRP includes the following elements:

- An overview of RRRP regulatory drivers and guidelines
- Construction clearance survey methods
- Disturbance analysis
- Reclamation, restoration and revegetation methods
- Salvage and transplanting methods
- Success criteria and contingency measures
- Post treatment and transplant maintenance
- Post-construction monitoring methods
- Reporting requirements

Implementation of the RRRP will promote restoration of habitat function and quality for desert tortoise in areas temporarily disturbed by the Proposed Project.

Conclusion for On-Site Mitigation

The on-site mitigation measures and APMs detailed above to protect tortoises during construction and to provide for revegetation of temporarily disturbed areas will provide substantial mitigation for the Proposed Project's adverse effects on desert tortoise and provide considerable protection for individual specimens. Implementation of these measures, including reclamation of disturbed habitat, contributes to meeting the CESA requirement to fully mitigate the impacts associated with the Proposed Project.

8.2 Off-Site Habitat Mitigation

Off-site mitigation will also be provided to compensate for residual effects that cannot be mitigated on site. In addition to avoidance and minimization measures, the Proposed Project's adverse effects on desert tortoise are proposed to be fully mitigated through implementation of off-site habitat mitigation generally consisting of habitat acquisition, preservation, and funding for long-term management. Table 2 shows the proposed compensatory mitigation requirements for impacts to desert tortoise habitat called for by the resource agencies.

Table 2
Proposed Compensatory Mitigation for Impacts to Habitats for Desert Tortoise

Desert Tortoise	Approved Mitigation Ratio	Total Impact Acreage[1]	Required Compensatory Mitigation Acreage
Designated Critical Habitat	5:1	2.01	10.05
BLM Non-Designated Habitat	1:1	49.72	49.72
CDFG Non-Designated Habitat	2:1	49.72	99.44
Total Compensatory Mitigation Acreage			**159.21**

[1] Total Impact Acreage from Table 1

SCE intends to engage the services of a third party, Wildlands Inc., to acquire and certify a suitable private lands mitigation solution with CDFG, based on the requisite compensatory mitigation identified above. Final certification or approval of the mitigation solution may also include U.S. Fish and Wildlife Service, BLM and CPUC. SCE expects that the solution will involve acquisition and preservation of suitable Habitat Mitigation (HM) lands consisting of one or more private parcels containing habitat for desert tortoise that contains or is functionally equivalent to fulfill mitigation acreage requirements. Once suitable HM lands are determined, plans for conservation and habitat management will be developed and a conservation easement would be recorded.

SCE is responsible for funding the acquisition, and implementation of necessary habitat enhancement, interim and long-term management efforts, and conservation provisions of

the off-site mitigation solution, although responsibility for implementation may be delegated to a third party.

The National Fish and Wildlife Foundation (NFWF) has been identified as an appropriate entity to hold endowment funds provided for the long-term management and monitoring of HM lands. The Wildlife Heritage Foundation has also been identified as an appropriate conservation easement holder.

In addition the following provisions are proposed:

- The Permittee (SCE) shall provide for the interim management of the Habitat Mitigation (HM) lands, if necessary. Interim management period activities may include activities such as fence repair, trash removal, site monitoring, vegetation management, etc.
- The Permittee, or a third party on behalf of the Permittee, shall submit to CDFG for review and approval the results of the Property Analysis Record (PAR) or PAR-equivalent analysis to determine the funds needed for a long –term endowment for managing HM lands for conservation before transferring funds to the Endowment Fund Manager.
- The Permittee, or a third party on behalf of the Permittee, shall provide CDFG staff with reasonable access to HM lands under Permittee control, and shall otherwise fully cooperate with CDFG efforts to verify compliance with or effectiveness of mitigation measures set forth in the ITP.

9.0 PROPOSED PLAN TO MONITOR COMPLIANCE WITH THE MINIMIZATION AND MITIGATION MEASURES AND THE EFFECTIVENESS OF THE MEASURES

Monitoring and documentation of monitoring efforts to avoid, minimize and mitigate impacts to desert tortoise and its habitat will be conducted pre-construction, throughout construction and during operations and maintenance activities post-construction, and related to off-site Habitat Mitigation (HM) lands. The established monitoring and reporting specifications, as included in the applicant proposed measures (APMs) and mitigation measures (MMs), as set forth in Section 8, are proposed to sufficiently observe and document implementation of these measures and provide adequate opportunity to determine efficacy. The main elements of the compliance monitoring plan included in the APMs and MMs are described here.

- **Field Contact Representative Assigned.** A field contact representative (FCR) will be designated and will oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities would at a minimum include conducting preconstruction surveys, assuring proper removal of desert tortoise, staffing biological monitors on construction spreads, and upholding all conditions authorized. The FCR would also oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion.
- **Monitoring During Construction.** Construction monitoring will employ a designated field contact representative, authorized biologist(s), and qualified biologist(s) approved by the BLM during the construction phase. At a minimum, qualified biologist(s) will be present during all activities in which encounters with tortoises could occur. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized biologist is defined as a wildlife biologist who has been authorized to handle desert tortoises by the USFWS. A field contact representative is defined as a person designated by the project proponent who is responsible for overseeing compliance with desert tortoise protective measures and for coordination with agency compliance officer(s).
- **Reporting Requirements.** Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan will be documented immediately by the biological monitor. The field contact representative will ensure that appropriate corrective action is taken. Corrective actions will be documented by the monitor. The following incidents will require immediate cessation of the construction activities causing the incident, including (1) imminent threat of injury or death to a desert tortoise; (2) unauthorized handling of a desert tortoise, regardless of intent; (3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and (4) conducting any construction activity without a biological monitor where one was required. If the monitor and field contact representative do not agree, the federal agency's compliance officer will be contacted for resolution. All parties may refer the resolution to the federal agency's authorized officer.
- **Reporting Requirements.** Results of biological monitoring and status of construction will be detailed in daily reports by biological monitors. These reports will be submitted to the authorized biologist on a daily basis and to the FCR on a weekly basis (at minimum). The authorized biologist will notify the FCR within

24 hours of any action that involves harm to a desert tortoise, or involves a blatant disregard by construction personnel for the APMs or MMs designed to minimize impacts on desert tortoise or other wildlife. The authorized biologist will submit to the USFWS, NDOW, CDFG, and CPUC a summary of all desert tortoises seen, injured, killed, excavated, and handled at the end of the project or within 2 working days of when desert tortoises are harmed.

- **Incident Reporting Requirements.** Should any desert tortoise be injured or killed, all activities will be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist will be responsible for reporting the incident to the authorizing agencies.
- **Notification if Animal Harmed.** If a desert tortoise is injured as a result of project-related activities, it shall be immediately taken to a CDFG-approved wildlife rehabilitation or veterinary facility. The applicant shall identify the facility prior to the start of ground- or vegetation-disturbing activities. The applicant shall bear any costs associated with the care or treatment of such injured covered species. The applicant shall notify CDFG of the injury immediately unless the incident occurs outside of normal business hours. In that event CDFG shall be notified no later than noon on the next business day. Notification to CDFG shall be via telephone or email, followed by a written incident report. Notification shall include the date, time, location, and circumstances of the incident, and the name of the facility where the animal was taken.
- **Revegetation Monitoring Requirements.** Implementation of the RRRP and associated progress monitoring efforts and reporting requirements (Appendix 6).

10.0 A DESCRIPTION OF THE FUNDING SOURCE AND THE LEVEL OF FUNDING AVAILABLE FOR IMPLEMENTATION OF THE MINIMIZATION AND MITIGATION MEASURES

As the Permittee, SCE shall provide long-term management funding for the in-perpetuity management of the Habitat Mitigation (HM) lands by establishing a long-term management fund (i.e., Endowment Fund). The Endowment Fund is a sum of money, held in a CDFG-authorized trust fund that provides funds for the perpetual management, maintenance, monitoring, and other activities on the HM lands consistent with the management plan(s) as used in this ITP shall refer to the endowment deposit and all interest, dividends, other earnings, additions and appreciation thereon.

For the purpose of the permit application, the cost of acquisition, protection, and management of the HM lands or other mitigation measures will be determined as follows:

- Land acquisition costs for HM lands will be determined upon finalization of Permit conditions. Land acquisitions costs will be estimated using local fair market current value for lands with habitat values meeting mitigation requirements;
- Long-term management funding will be determined using a Property Analysis Record (PAR) or PAR equivalent analysis upon finalization of the HM Lands management plan.
- A complete Off-site Habitat Mitigation package including an approved management plan, draft conservation easement, PAR analysis and any other necessary documents as determined by the Permittee and/or a third party on behalf of the Permittee and CDFG, will be submitted to CDFG for approval funds within 18 months of the effective date of this ITP.

The Permittee, or a third party on behalf of the Permittee, shall work with CDFG to identify an Endowment Fund Manager. Endowment Funds are expected to be held in trust by the National Fish and Wildlife Foundation as this entity is understood to be approved by CDFG to hold endowment funds.

The Permittee, or a third party on behalf of the Permittee, shall calculate the endowment funds deposit. After obtaining CDFG approval of the HM lands, interim and/or long-term management plan, and Endowment Fund Manager, Permittee shall prepare a PAR or PAR-equivalent analysis to calculate the amount of funding necessary to ensure the long-term management of the HM lands (Endowment Deposit Amount). The Permittee, or a third party on behalf of the Permittee, shall submit to CDFG for review and approval the results of the PAR or PAR-equivalent analysis before transferring funds to the Endowment Fund Manager. Portions from the Endowment Fund shall be available for reinvestment in the principal, administrative fees, conservation easement monitoring and defense, land protection enforcement measures, and the long-term management, maintenance, monitoring and protection of the HM lands pursuant to the management plan.

The Permittee, or a third party on behalf of the Permittee, shall transfer the long-term endowment funds to the Endowment Fund Manager upon CDFG approval of the Endowment Deposit Amount. The approved Endowment Fund Manager may pool the Endowment Fund with other endowments for the operation, management, and protection of HM lands for local populations of the desert tortoise but shall maintain separate accounting for each Endowment Fund.

Permittee shall reimburse CDFG for all reasonable expenses incurred during title and documentation review, expenses incurred from other state agency reviews, and overhead related to transfer of HM Lands to CDFG.

11.0 CERTIFICATION OF APPLICATION

I certify that the information submitted in this application is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to suspension or revocation of this permit and to civil and criminal penalties under the laws of the State of California.

_____

Cecil R. House
Senior Vice President
Safety, Ops Support & Chief
Procurement Officer
Southern California Edison

12.0 COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT (14 CCR 783.3(B))

Section 783.3 of Title 14 of the California Code of Regulations lays out CEQA-compliance requirements where CDFG is the responsible or lead agency for purposes of issuing an Incidental Take Permit. Subsection 783.3(a) does not apply here because CDFG is the lead agency and not the responsible agency. Subsection 783.3(b) applies here because CDFG is the CEQA lead agency here.

Section 783.3(b) requires submittal of information by the Project applicant showing compliance with CEQA requirements. The submission of compliance information does not need to be concurrent with the submission of the Incidental Take Permit application: "[t]he analysis and information required by this section shall be provided to the Department [CDFG] as soon as reasonably practicable following the submission of a permit application." (14 CCR 783.3(b)).

Pursuant to Section 783.3(b), an applicant must submit the following information in addition to that information required by 14 CCR 783.2. First, the applicant must provide information to CDFG regarding whether the Project may result in significant adverse environmental effects in addition to those impacts of taking analyzed in the Incidental Take Permit. Second, if additional significant adverse environmental effects are found to exist, the applicant must state whether feasible alternatives or mitigation measures would avoid or lessen those significant adverse effects. Third, the applicant must analyze all potentially significant adverse environmental effects resulting from the Project and include a discussion of the feasible alternatives and mitigation measures that will be used to avoid or substantially lessen those significant adverse environmental effects with documentation to support that analysis. Fourth, if the analysis identifies significant adverse environmental effects for which feasible mitigation measures are not available, the applicant must also include a statement describing specific environmental, economic, legal, social, technological, or other benefits which might justify the significant environmental effects created by the Project.

A Final EIR/EIS was jointly prepared by the CPUC and BLM supplying all of the information required by 14 CCR 783.3(b). Supporting technical studies, including biological surveys, have been prepared regarding the species proposed to be covered by the ITP, as well as regarding all other environmental issues triggered by the EITP.

13.0 REFERENCES

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APPENDICES

APPENDIX 1

Project Components and Related Impacts in California

The calculation impacts in the following tables use the "area squared" method to estimate impacts based on typical project features. The total acres of new habitat disturbance reflects both temporary and permanent impacts. These calculations and numerical values are based on the evaluation of impacts presented in the Biological Assessment (Appendix 2, Table 1 (SCE 2010a)), but which would occur in the California portion of the Proposed Project.

Table 1.1 EITP Transmission Project Features and New Habitat Disturbance in California

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Total Approximate Acres of New Habitat Disturbance
Guard Structures	6	50 feet x 75 feet	0.5
Remove Existing Lattice Steel H-frame	33	150 feet x 75 feet	8.5
Construct New Lattice Steel Suspension Structure	29	200 feet x 200 feet	26.6
115-kV Conductor Removal and 220-kV Conductor and fiber optic ground wire (OPGW) Stringing Setup Area - Puller	2	200 feet x 150 feet	1.4
115-kV Conductor Removal and 220-kV Conductor and OPGW Stringing Setup Area - Tensioner	2	500 feet x 150 feet	3.4
(1) Transmission Total Habitat Impacts			**40.4**

Table 1.2 EITP Telecommunication Project Features and New Habitat Disturbance in California

- Path 1 Impacts			
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Total Approximate Acres of New Habitat Disturbance**
Work Area Outside Ivanpah Substation	1	40 feet x 60 feet	0.002
Subtotal Habitat Impacts			**0.002**
- Path 2 - Section 1 Impacts			
Nipton - Material and Equipment Staging Area	1	2.5 acres	2.5

Subtotal New Habitat Impacts			**2.5**
- Path 2 - Section 2 Impacts			
4,300 Feet Underground Fiber Cable Duct	1	6.8 feet x 4,470 feet	0.70
Underground Vaults	4	6 feet x 6 feet	0.003
Work Area for Underground Vaults and Fiber Pulling Area	6	40 feet x 60 feet	0.3
Microwave site at Nipton	1	100 feet x 100 feet	0.2
Subtotal New Habitat Impacts			**1.2**
(2) Telecommunications Total Habitat Impacts			**3.7**

Table 1.3 EITP Other Transmission New Habitat Disturbance in California

- Subtransmission Line Impacts			
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Total Approximate Acres of New Habitat Disturbance**
Remove existing lattice steel H-frame and construct new TSP	1	200 feet x 100 feet	0.5
Remove existing lattice steel H-frame and construct new LWS H-frame	6	200 feet x 100 feet	2.8
Construct new tubular steel pole	3	200 feet x 100 feet	1.4
Construct new LWS H-frame	6	200 feet x 100 feet	2.8
Subtransmission Line Total			**7.5**
- Distribution Line Loop Impacts			
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Total Approximate Acres of New Habitat Disturbance**
Underground trench/duct for conduit	1	2,600 feet x 1.5 feet	0.1
Underground manhole installation	2	10 feet x 15 feet	0.007
Work area for underground manholes pulling area	2	40 feet x 60 feet	0.1
Work area pulling of 3/8 mile of 1/0 ACSR pole line construction	3	40 feet x 60 feet	0.2
Distribution Line Loop Habitat Total			**0.4**
- Distribution Line to Nipton Microwave Site Impacts			
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Total Approximate Acres of New Habitat Disturbance**
Install new wood poles	10	25 feet x 25 feet	0.1
Work area for pulling conductor	2	40 feet x 60 feet	0.1
Total			**0.2**
(3) Other Transmission Total Habitat Impacts			**8.1**

Appendix 2: Southern California Edison, (SCE), 2010a. Draft Eldorado-Ivanpah Transmission Project, Eldorado Substation, Nevada to Ivanpah Substation, California, Biological Assessment

Appendix 3: Karl, Alice E. 2010. Draft Southern California Edison Eldorado-Ivanpah Transmission Line Project Desert Tortoise Surveys. Prepared by Alice E. Karl, Ph.D. Prepared for Environmental Planning Group, Inc., January 2010.

Appendix 4: Environmental Planning Group, Inc. (EPG) 2010. Draft Southern California Edison Eldorado-Ivanpah Transmission Project, 2010 Desert Tortoise Survey Report

Appendix 5: SCE, 2010c. Draft Eldorado-Ivanpah Transmission Project Raven Management Plan, October 2010.

Appendix 6: SCE, 2011. Eldorado to Ivanpah Transmission Project Reclamation, Restoration and Revegetation Plan. April, 2011

Appendix 7: Cash Receipt for Payment of California Department of Fish and Game Environmental Filing Fee 2010

Appendix 8: CEQA Notice of Determination

(Decision Granting a Certificate of Public Convenience)

Appendix 9: Wildlands Inc. – Statement of Qualifications / Brochure

Eldorado-Ivanpah Transmission Project

Streambed Alteration Agreement

Anticipated Submittal Date: 10/31/2011

Eldorado-Ivanpah Transmission Project

401 Certification

California Division of Water Resources

Anticipated Submittal Date: 10/31/2011

Eldorado-Ivanpah Transmission Project

Appendix B3 – California Local Permits

San Bernardino County – Encroachment Permit T11002151

Grading Permit San Bernardino County

Hiperión-Ivanpah Transmission Project

Right-of-Way Encroachment Permit County of San Bernardino Dept of Public Works – Permit T1102021151

Eldorado-Ivanpah Transmission Project

Right-of-Way Encroachment Permit

County of San Bernardino Dept of Public Works – Permit T11002151

COUNTY OF SAN BERNARDINO
DEPARTMENT OF PUBLIC WORKS
TRANSPORTATION PERMITS

ROAD EXCAVATION PERMIT

825 East Third Street
San Bernardino, CA 92415
(909)387-8046

PERMITTEE COPY

DIST: 14 **MAP:** 19R00 **ROAD NAME:** NIPTON ROAD
ACCOUNT NO.: **PARCEL NUMBER:**

Permittee SOUTHERN CALIFORNIA EDISON
2885 W. FOOTHILL BLVD
SAN BERNARDINO, CA 92376

Permit Number: T11002151
Permit Date: 08/01/2011
Permit Expires: 08/31/2012
Start Work: 09/01/2011

Contact: ROY ROJAS
Phone:626 893-4960

In accordance with your application dated 08/01/2011 , and subject to the provisions and requirements of County Code Code No. 51.011-51.059 and/or Provisions as may be attached hereto, PERMISSION IS HEREBY GRANTED TO encroach within County road right-of-way for the purpose of performing the following work:

DESCRIPTION:

NIPTON RD STARTING AT STATELINE WEST 13256' IN THE NIPTON AREA. EXCAVATE TO PLACE 13,256 LF OF 5" PVC CONDUIT & 10 - 4'X4'X6' MANHOLES. **ALL STREET REPAIRS MUST BE COMPLETED PER THE SAN BERNARDINO CO. DEPT. OF PUBLIC WORKS GENERAL PERMIT CONDITIONS AND TRENCH SPECIFICATIONS.**

Contact Don Bowen at (760) 995-8222 24 hours before start of work

CONSTRUCTION ITEMS:

Driveway: **Number:**0 **Curb&Gutter:** 0 **Sidewalk:** 0 **Paving:** 0 **Drainage:** **Wall:** **Other:** $0.00

UTILITY:

Electric: Y **Sewer:** **Telephone:** **Water:** **CATV:** **Gas:** **Fiber Optic:** **Other:**

Length: 13256 **Width:** 2 **Size and Material:** 5" PVC **Work Order:** WR#800697442-1

ENCROACHMENT:

Driveway: **Parking Deck:** **Retaining Wall:** **Tree Removal:** **Other:**

(SEE REVERSE AND ATTACHED FOR PERMIT CONDITIONS)

This permit is to be strictly construed and no work other than that specifically mentioned above is authorized hereby. Performance of the work deemed to be acceptance by the permittee of all terms and conditions of this permit.

Exempt	N	RECEIPT NO.	
Charge	Y	APPLICATION/ISSUANCE	$150.00
Cash	N	INSPECTION FEE	$3,650.00
		EXPEDITION FEE	$0.00
		VIOLATION FEE	$0.00
		TOTAL PERMIT FEE	$3,800.00
		DEPOSIT	$0.00

Permit Engineer
Transportation Department

COUNTY OF SAN BERNARDINO
DEPARTMENT OF PUBLIC WORKS
TRANSPORTATION PERMITS

ROAD EXCAVATION PERMIT

825 East Third Street
San Bernardino, CA 92415
(909)387-8046

PERMITTEE COPY
T11002151

GENERAL PROVISIONS

NOTIFICATIONS: Permittee shall notify the Inspection Section on a form provided by the County Transportation Department (1) Date work is to start. (2) Date work has been completed.

COMPLIANCE WITH STATE CONSTRUCTION SAFETY ORDERS: Permittee and/or it's contractor where applicable shall obtain a permit from Division of Industrial Safety, State of California, prior to trench excavation if the excavation is over five feet in depth or workmen will be endangered by moving ground.

UNDERGROUND UTILITIES LOCATION: Prior to beginning any activity authorized in this permit, the Permittee and/or Permittee's authorized agent, shall notify Underground Service Alert (USA) at 1-800-422-4133 at least 48 hours in advance to coordinate the permit activity.

SURVEY MONUMENTS: Where there is a possibility of a survey monument or monuments being disturbed or destroyed, they shall be located, referenced and a Corner Record filed with the County Surveyor prior to the start of construction. Survey monuments shall be reset in the surface of the new construction, a suitable monument box placed thereon, or permanent witness monuments set and a Corner Record filed with the County Surveyor prior to final project clearance. All work shall be performed under the direction of a licensed Land Surveyor or registered Civil Engineer at the expense of the permittee.

PROTECTION OF TRAVELING PUBLIC: Permittee shall take adequate precautions for the protection of the traveling public at all times. Barricades, flashing amber lights, and warning signs together with flagmen, where necessary, shall be placed and maintained in accordance with the current Department of Public Works, State of California, publication entitled 'Manual of Traffic Controls' until the excavation is refilled, the obstruction removed, and the roadway is made safe for the use of the traveling public.

ROAD CLOSURE: Closure can only be granted by formal application to the County Transportation Department. Allow one week to process request for overnight closure. Permittee shall notify the Fire Department, California Highway Patrol and County Sheriff's Office prior to any period of road closure.

TRENCHING ACROSS ROADWAY: Unless formal approval has been granted for full road closure, excavation of trenches across any roadway shall be progressive. Not more than ½ of the width of a traveled way shall be closed at one time and the remaining width of traveled way shall be kept open to traffic by bridging or backfilling.

ROAD RESTORATION: Trench repair and replacement of pavement shall be accomplished according to attached Special Provisions for utility trench work within County road right-of-way. If permittee fails or refuses to refill any excavation which he has made, or replace any pavement he has removed or damaged, or remove any obstruction which he has placed in any County roadway, the County Transportation Department may take corrective action as necessary to protect the roadway and traveling public and the Permittee shall reimburse the County Transportation Department for any costs thereof.

PAYMENT OF COSTS: Permittee is liable for and shall pay upon demand all County Transportation Department costs related to the permit including but not restricted to the costs of repairing or restoring the County roads to the same or equal condition that they were in before being cut or damaged as a result of Permittee's activities.

HOLD HARMLESS CLAUSE: Permittee agrees to indemnify County, it's officers, agents, and employees against and hold them harmless of and from all claims and liabilities of any kind arising out of, in connection with or resulting from negligence on part of Permittee, it's officers, agents, contractor, and employees in connection with work undertaken under this permit, and defend County and it's officers, commissions, agents and employees from any suits or actions at law or in equity from damages, and pay all court costs and counsel fees.

RELOCATION CLAUSE: Permittee may be required to remove or relocate the permitted facility at his own cost should the road need to be widened or reconstructed or for any other reason as determined by the County Transportation Department. The removal and/or relocation of said improvements shall be accomplished at no expense to San Bernardino County Transportation Department.

EXCAVATION PERMIT

1. All trench backfill and pavement repairs shall be accomplished to comply with the attached General Permit Conditions and Trench Specifications. Any survey monuments damaged or removed by permittee's activities shall be restored or replaced at Permittee's expense.

2. Upon completion of the work, all brush, timber, scraps, and material shall be entirely removed and the right-of-way left in as presentable condition as before work started.

3. Notify Inspector 24 hours prior to beginning work.

4. Traffic Control shall be in accordance with the Cal Trans "Manual of Traffic Controls for Construction and Maintenance Work Zones" or as directed by the inspector.

5. Road Closure: Closure can only be granted by formal application to the Department of Public Works. Allow fifteen (15) working days to process the request for closure. Permittee shall be required to notify all residents and businesses at least 7 days prior to road closure. A letter will be provided as a guide by the Department of Public Works for permittee to mail out. Permittee shall notify Fire Department, California Highway Patrol, County Sheriff's, Department and local School District at least 72 hours prior to any period of road closure.

MAINTENANCE GUARANTEE

Under the provisions of San Bernardino County Code Section 51.0210 adopted by the Board of Supervisors on September 17, 1979, the highway surface excavated or damaged shall be replaced by the permittee to as good or better condition as the same was in before such work was begun and shall be maintained for the life of the utility encroaching in the public road after the completion of the work performed under the permit, during which life time period the permittee shall repair and make good any injury or damage to any portion of the highway which occurs as a result of work done under the permit.

PROTECTION OF SURFACE AND UNDERGROUND FACILITIES

Permittee shall receive an inquiry identification number from Underground Service Alert, telephone number 1-800-227-2600 prior to performing any work authorized by this permit, including all surface and underground excavation operations. Permit shall not be valid until the inquiry number is received. Underground Service Alert requires a minimum of 48 hours notice prior to the beginning of work to verify the location and ties of survey monuments, valve covers, meter boxes, manholes, hand holes and underground facilities

SEDIMENT & EROSION CONTROL

All earth material remaining on the roadway pavement, at the completion of permit work, shall be removed by brooming and/or sweeping to reduce the possibility of this material being carried by runoff and/or deposited in a stream, drainage course, natural water course, lake or other area. This work is required per Section 810.0511 (b) of Ordiance No. 2342 adopted by the Board of Supervisors March 12, 1984. National Pollutant Discharge Elimination System, Federal law, State law and local ordinance shall be strictly enforced.

Transportation Permit Section

Revised: May 4, 2009

Eldorado-Ivanpah Transmission Project

Grading Permit
San Bernardino County

Anticipated Submittal Date: 2/15/2012

Eldorado-Ivanpah Transmission Project

Appendix B4 – Nevada State Permits

ROW Encroachment Permit – Nevada DOT

401 Certification - Nevada Division of Environmental Protection (NDEP) Permit NV401-11-022

Temporary Permit for Working in Waterways - Nevada Bureau of Water Pollution Control – Permit TNEV2012329

Public Utilities Commission Of Nevada - Utility Environmental Protection Act

Utility Environmental Protection Act – Permit to Construct (12 Permits)

NDEP Stormwater General Permit NVR100000

Eldorado-Ivanpah Transmission Project

Right-of-Way Encroachment Permit
Nevada Department of Transportation

Anticipated Submittal Date: 11/4/2011

Eldorado-Ivanpah Transmission Project

401 Certification
Nevada Division of Environmental Protection – Permit NV401-11-022

Eldorado-Ivanpah Transmission Project

401 Certification

Nevada Division of Environmental Protection – Permit NV401-11-022

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
Colleen Cripps, Ph.D., Administrator

July 8, 2011

Ms. Patricia McQueary
U.S. Army Corps of Engineers
321 North Mall Drive, Suite L-101
St. George, Utah 84790

Dear Ms. McQueary,

The Nevada Division of Environmental Protection (NDEP) grants 401 Water Quality Certification (NV401-11-022) for the Eldorado Ivanpah Transmission Line Project located in Clark County, Nevada. The project will primarily consist of replacing an existing 115 kV transmission line with a 220 kV line and installing a new telecommunications line from the Eldorado substation near Boulder City to Hwy 164 near the California/Nevada border. The lines will impact approximately 0.199 acres of ephemeral washes that drain either to Ivanpah Dry Lake in California or Piute Wash, a tributary to the Colorado River. **Photographs which document conditions before, during and after construction at the Nevada jurisdictional waterbody crossing sites should be submitted to the Bureau of Water Quality Planning (BWQP) 30 days following project completion.** Photos must include BMPs used to prevent erosion, control sediment and protect water quality. If straw bales are selected as BMPs they should be certified as weed free.

Any modifications to original project submittal must be reviewed and approved by this office prior to implementation.

All conditions of NDEPs Temporary Authorization To Discharge Permit (Construction / Dewatering Permit) or any other permit issued by NDEP for the project must be followed.

This Section 401 Water Quality Certification is **subject to the acquisition** of all necessary local, regional, state and federal permits and approvals as required by law. Failure to meet any conditions of this 401 Water Quality Certification or the Temporary Authorization Permit (Construction/Dewatering Permit) or any other permit issued by NDEP for this project or any violation of NAC 445A may result in the revocation of this 401 Water Quality Certification.

If you have any questions, please contact me via email or at 687-9456.

Sincerely yours,

Jeanmarie Stone

Jeanmarie Stone
Environmental Scientist III
Bureau of Water Quality Planning

cc: Hazem Gabr, Southern California Edison
Richard Haywood, Southern California Edison
Jeryl Gardner, NDEP

Eldorado-Ivanpah Transmission Project

Temporary Permit for Working in Waterways

Nevada Bureau of Water Pollution Control – Permit TNEV2012329

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NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
Colleen Cripps, Ph.D., Administrator

September 26, 2011

Richard Haywood
Southern California Edison
1218 South 5th Avenue
Monrovia, CA 91016

Subject: Temporary Permit TNEV2012329 –SCE – Eldorado-Ivanpah Transmission Line Project Working in Waterways Permit

Mr. Haywood:

Enclosed please find a new 1st and 3rd page of the working in waterways permit for the above-cited project. I noticed the expiration date, quarterly report date, and final report date were all incorrect. Please replace pages 1 and 3 of the previous permit with the 1st and 3rd pages included in this package. The temporary permit is in effect from **October 1, 2011** to **March 31, 2012**.

Please note the requirements for monitoring, sampling and reporting. Quarterly reporting is required by the permit, and the first Quarterly Report is due **January 28, 2012**. The final narrative report and photo documentation is due **April 28, 2012**, or by the 28th day of the month following project completion, whichever comes first.

If you have any questions regarding this, please contact me at (775) 687-9458.

Sincerely,

Robert E. Wimer, Jr., E.I.
Bureau of Water Pollution Control

Enclosure: Temporary Permit TNEV2012329

cc: BWPC Compliance Coordinator (hand-delivered)
Jean Stone, BWQP (electronic)
Patricia McQueary, USACE –St. George Office, 321 N. Mall Dr., St. George, UT 84790 (w/permit)

TNEV2012329

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

TEMPORARY
AUTHORIZATION TO DISCHARGE

In compliance with the provisions Chapter 445A of the Nevada Revised Statutes (NRS), the Permittee,

Southern California Edison
1218 South 5th Avenue
Monrovia, CA 91016

is authorized to operate heavy equipment (rolling stock) and to continue work in waters of the State for two electric utility telecommunications line construction projects traversing 28 miles and 27.5 miles in southern Nevada, in accordance with the plans and information submitted to NDEP for the project located in:

Clark County, Nevada

in receiving waters named:

waters of the State including: various dry or ephemeral channels and washes

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on **October 1, 2011**.

This permit shall expire at midnight **March 31, 2012.**

Signed this 26th day of September, 2011.

Robert E. Wimer, Jr., E.I.
Bureau of Water Pollution Control

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PART I

I.A. EFFLUENT LIMITATIONS, MONITORING, AND CONDITIONS

Introduction: The Eldorado-Ivanpah Transmission Line Project (Project), proposed by Southern California Edison (SCE), proposes to replace and upgrade the existing electric transmission system with a newer and larger transmission line, upgrade the existing Eldorado Substation, and build the new Ivanpah Substation and communications facilities that will provide sufficient capacity to interconnect and deliver up to 1,400 megawatts of renewable energy that is planned or expected to be developed in the Ivanpah Valley area. The Nevada portions of the Project traverse 28 miles and 27.5 miles of southern Nevada and cross many ephemeral washes (waterbodies). Nevada project areas are located wholly in Clark County. Within Clark County, there are 508 ephemeral surface waterbodies to be crossed by the Project. Standard transmission line construction techniques will be employed along the Project route. Those techniques typically involve the sequential operations of fencing, clearing and grading, ditching, stringing and bending, lowering and backfilling, and cleanup and restoration. Best Management Practices (BMPs) will be adhered to for all work components and possible flow conditions.

I.A.1. **Effluent Limitations:** During the period beginning on the effective date of this permit and lasting until the permit expires, the Permittee is authorized to work in waters of the State in the subject areas of the waterbodies. Sediment and water management Best Management Practices (BMPs) shall be implemented to prevent sedimentation and erosion downstream as much as is practicable, in accordance with plans and information submitted to NDEP.

I.A.2. **Monitoring Requirements:**

Narrative and Photo Documentation: Project monitoring shall be conducted by means of a concise narrative report describing the project and a series of photos documenting the project activities as presented to NDEP, including the implementation of Best Management Practices (BMPs). The "before, during and after" photos, shall document all transmission line installation-related activities, as well as restoration activities. The photos shall be taken from established photo points. The photos, along with the narrative report of the project activities, shall be submitted to the Division quarterly, by the 28th day of the month following the end of the quarter, or conclusion of the project, whichever is less.

Sampling and Monitoring:
Turbidity: For all streams with flows greater than a foot wide or a foot deep at the time a project activity crosses that waterbody, turbidity monitoring is required. For each project activity that involves work in or near the above described waterbodies, a background sample shall be collected for turbidity, in the centroid of flow, approximately 100 feet upstream of the proposed activity. The Permittee or designated contractor shall identify potential upstream and downstream sampling points for each of the affected waterbody crossings in the event of required sampling. During the project activity, if a visible turbidity plume is generated, a grab sample shall be obtained from the center of the plume, approximately 200 feet downstream of

the activity causing the plume, and analyzed with a handheld meter. If the reading is ≥10 Nephelometric Turbidity Units (NTUs) over background for greater than 15 minutes, the Permittee shall re-evaluate the BMPs, make adjustments and notify the Division by calling the permit writer within 48 hours the incident. All readings shall be recorded in a separate water quality logbook, with other essential information (time, flow {or stream width and depth}, plume length, width and depth, and identification of the project activity likely responsible for the plume, what BMPs were in place at the time, and what BMPs are proposed to alleviate the plume, and any other pertinent information). If the plume persists for longer than 30 minutes, the plume-causing activity shall cease, and the Division shall be notified immediately. **Petroleum Hydrocarbons:** In all waterbodies, if a petroleum hydrocarbon (fuel, grease, solvent, etc.) sheen is evident, then a grab sample shall be obtained from the sheen, and sent to a Nevada State Certified laboratory for analyses of TPH –full range organics. If a fuel leak or other equipment failure causes a sheen, the NDEP spill line shall be notified within 24 hours of occurrence at 1-888-331-6337.

Sampling/monitoring results and information via the water quality logbook shall be submitted quarterly (twice during the permit life): January 28, 2012 and April 28, 2012.

I.A.3. **Specific Conditions:** For or any heavy equipment used in the project areas in and near all of the unnamed ephemeral washes in Clark County, Nevada, the operations shall be conducted in accordance with the plans information, the specifications submitted to the Division, and the following terms and conditions:

a. Any heavy equipment to be used in the project areas must be steam cleaned at least once before work in and near the water bodies. All equipment shall be inspected for leaks daily prior to use. All leaks shall be repaired immediately. All equipment fueling and storage of fuels shall be conducted off-site and at least 100 feet away from the water bodies.

b. Best Management Practices (BMPs) shall be applied and precautions shall be taken to prevent and control releases of: debris, sediment, any transport of sediments, and to prevent and control turbidity in the water bodies during the construction activities.

c. A record shall be kept of each day's use of heavy equipment in the project areas.

d. Every precaution must be taken in site stabilization of the area by the replacement of vegetation as applicable and practicable.

e. The Permittee, **Southern California Edison**, bears the responsibility to ensure that the requirements of this temporary permit are fully satisfied.

I.A.4. **Schedule of Compliance:** The Permittee shall achieve compliance with the permit limitations upon issuance of the permit.

I.A.5. **Documentation:** Documentation must be submitted as specified in Part I.A.2.

I.A.6. **Quarterly Report and Final Report:** A Quarterly Report containing the information recorded in the water quality logbook, if any, and a brief narrative of the first quarter's project activities, shall be submitted as described in Part I.A.2. No photo documentation is required for the quarterly submittal.

The final report with photos describing and documenting the results of the project's activities shall be submitted after the end of the permit. The report shall also contain the water quality logbook containing all the data and information related to water quality exceedances and corrective actions as described in Part I.A.2. The report shall contain the original signature of the Engineer-In-Charge of the project. **The final report shall be received, at the address given below, by the 28th day of the month following project completion or permit expiration, whichever comes first.**

Nevada Division of Environmental Protection
Bureau of Water Pollution Control
ATTN: Compliance Coordinator
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

I.A.7. **Water Quality Standards:** There shall be no discharge of substances that would cause a violation of water quality standards of the State of Nevada.

I.A.8. **Sediment Discharge:** There shall be no discharge of sediment in other than trace amounts.

I.A.9. **Odors:** There shall be no objectionable odors generated in the conduct of this project.

I.A.10. **Authorized Project Activities:** There shall be no water management or rolling stock activities undertaken except those as authorized by this permit.

I.A.11. **Plan Approval:** The project elements/components/activities shall be constructed and or conducted in accordance with the plans submitted to and approved by the Division. **If at any time after the permit is issued the route changes, a new route, identifying the changes in the waterbody crossings, shall be submitted to the Division for approval. The plans must be approved by the Division prior to the start of construction. All changes to the approved plans must be approved by the Division.**

I.A.12. **Presumption of Possession and Compliance:** Copies of this permit, any subsequent modifications shall be maintained at the permitted project site at all times.

I.B. MONITORING AND REPORTING

I.B.1. Monitoring

a. **Representative Samples:** Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

b. **Test Procedures:** Analyses shall be conducted by a "certified laboratory" using an "approved method of testing", as defined in NAC 445A.0564 and NAC 445A.0562, respectively.

c. **Recording the Results:** For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:

i. The exact place, date, and time of sampling;
ii. The dates the analyses were performed;
iii. The person(s) who performed the analyses;
iv. The analytical techniques or methods used; and
v. The results of all required analyses, including reporting limits.

d. **Additional Monitoring by Permittee:** If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in any calculation and/or reported value required by this permit. Such increased frequency shall also be indicated in required reports.

e. **Records Retention:** All records and information resulting from monitoring activities; the permit application; reporting required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation shall be retained for a minimum of five (5) years or longer if required by the Administrator.

f. **Reporting Limits:** Unless otherwise allowed by the Division, the approved method of testing selected for analyses shall have a reporting limit which is:

i. Half or less of the discharge limit; or, if there is no discharge limit,
ii. Half of less of the applicable water quality criteria; or, if there is no limit or criteria,
iii. The lowest reasonably obtainable limit using an approved test method.

g. **Modification of Monitoring Frequency and Sample Type:** After considering monitoring data, discharge flow, discharge frequency, and receiving water conditions, the Division and/or Administrator may, for just cause, modify the monitoring frequency and/or sample type by issuing an order to the Permittee.

h. **Definitions**

i. **30-day average discharge:** means the total discharge during a month divided by the number of samples in the period that the facility was discharging. Where less than daily sampling is required by this permit, the 30-day average discharge shall be determined by the summation of all the measured discharges divided by the number of samples during the period when the measurements were made.

ii. **Daily maximum:** is the highest measurement obtained during the monitoring period.

iii. **30-day average concentration:** means the arithmetic mean of measurements made during a month.

iv. **"Discrete" sample:** means any individual sample collected in less than 15 minutes.

v. **Composite sample:** flow rate composite means the arithmetic mean of no fewer than six individual measurements taken at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. For other than flow rate a composite sample means a combination of no fewer than six individual flow-weighted samples obtained at equal time intervals for 24 hours, or for the duration of the discharge, whichever is shorter. Flow-weighted sample means that the volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling.

I.B.2. **Reporting:** Analytical data and monitoring results shall be summarized and/or tabulated for presentation in standardized Discharge Monitoring Reports (DMRs). Laboratory reports for quantitative analyses conducted by State of Nevada certified laboratories must accompany DMR submittals.

DMRs shall be received by the 28th day of the month following the effective date of the permit and the 28th day of each month for the duration of the permit. If no discharge occurs during the reporting period, summarize the project status and report "no discharge" on the submitted DMR.

DMRs must be signed by the authorized representative that is responsible for the facility. The first DMR submitted under this permit must include the written designation of the authorized representative elected to sign DMRs. The designated representative responsible for facility operations must sign each subsequent DMR submitted to the Division. If the authorized representative changes, a new designation letter must be submitted.

a. **Quarterly Reporting:** Monitoring results for turbidity and fuel sheens shall be summarized, tabulated and reported twice during the permit life, as described in Part I.A.2. The Permittee is considered in compliance if the reported results are less than the established permit limits.

b. **Other Information:** Where the Permittee becomes aware of failure to submit any relevant facts in a permit application or has submitted incorrect information in a permit application or in any report to the Division, the Permittee shall promptly submit such facts or information.

c. **Planned Changes:** The Permittee shall give notice to the Division as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition to a permitted facility:

i. Could significantly change the nature or increase the quantity of pollutants discharged; or

ii. Results in a significant change to the Permittee's sludge management practice or disposal sites.

d. **Anticipated Noncompliance:** The Permittee shall give advance notice to the Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

e. **Submittal:** An original signed copy of these reports, and all other reports required herein, shall be submitted to the Division at the following address:

Nevada Division of Environmental Protection
Bureau of Water Pollution Control
ATTN: Compliance Coordinator
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

I.B.3. **Signatory Certification Required on Application and Reporting Forms:**

a. All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

b. All applications, reports, or other information submitted to the Division shall be signed by one of the following:

i. A principal executive officer of the corporation (of at least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility from which the discharge described in the application or reporting form originates;
ii. A general partner of the partnership;
iii. The proprietor of the sole proprietorship; or
iv. A principal executive officer, ranking elected official, or other authorized employee of the municipal, state, or other public facility.

c. **Changes to Authorization:** If an authorization under Part I.B.3. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part I.B.3. must be submitted to the Administrator prior to or together with any reports, information, or applications to be signed by an authorized representative.

PART II

II.A. MANAGEMENT REQUIREMENTS

II.A.1. **Change in Discharge:** All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than, or at a level in excess of, that authorized shall constitute a violation of the permit.

Any anticipated facility expansions that will result in new, different, or increased discharges of pollutants must be reported by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Any changes to the permitted facility must comply with NAC 445A.283 to 445A.285. Pursuant to NAC 445A.263, the permit may be modified to specify and limit any pollutants not previously limited.

II.A.2. **Facilities Operation-Proper Operation and Maintenance:** The Permittee shall, at all times, maintain in good working order and operate as efficiently as possible all control facilities, collection systems, or pump stations installed or used by the Permittee to achieve compliance with the terms and conditions of this permit.

II.A.3. **Adverse Impact-Duty to Mitigate:** The Permittee shall take all reasonable steps to minimize releases to the environment resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. The Permittee shall carry out such measures, as reasonable, to prevent significant adverse impacts on human health or the environment.

II.A.4. **Noncompliance, Unauthorized Discharge, Bypassing, and Upset:**

a. Any diversion, bypass, spill, overflow, or discharge of wastewater from evaporation or conveyance facilities under the control of the Permittee is prohibited except as authorized by this permit. In the event the Permittee has knowledge that a diversion, bypass, spill, overflow, or discharge not authorized by this permit is probable, the Permittee shall immediately notify the Division by calling the Spill hotline at 775-687-9485 or 1-888-331-6337.

b. The Permittee shall notify the Administrator within twenty-four (24) hours of any diversion, bypass, spill, upset, overflow, or release of discharge other than that which is authorized by the permit, by calling the NDEP Spill Hotline at 1-888-331-6337. The following shall be included as information which must be reported within 24 hours:

i. Any unanticipated bypass which exceeds any effluent limitation in the permit;
ii. Any upset which exceeds any effluent limitation in the permit; and
iii. Any violation of a limitation for any toxic pollutant or any pollutant identified as the method to control a toxic pollutant.

c. A written report shall be submitted to the Division within five (5) days of diversion, bypass, spill, overflow, upset, or discharge detailing the entire incident including:

i. Time and date of discharge;
ii. Exact location and estimated amount of discharge;
iii. Flow path and any bodies of water which the discharge contacts;
iv. The specific cause of the discharge; and
v. The preventive and/or corrective actions taken.

d. The Permittee shall report all instances of noncompliance not reported under Part II.A.4.c. at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.A.4.c.

e. A "bypass" means the intentional diversion of waste streams from any portion of a facility.

i. Bypass not exceeding limitations: The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II.A.4.a. and II.A.4.b.
ii. Anticipated bypass: If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least ten (10) days before the date of bypass.

f. Bypass is prohibited, and the Division may take enforcement action against a Permittee for bypass, unless:

i. The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
ii. There were no feasible alternatives to the bypass, such as the use of auxiliary evaporation facilities or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurs during normal periods of equipment downtime or preventative maintenance; and
iii. The Permittee submitted notices as required under Part II.A.4.e.

g. The Division may approve an anticipated bypass, after considering its adverse effects, if the Division determines that it will meet the three conditions listed in Part II.A.4.f.

h. An "upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error,

improperly designed facilities, lack of preventive maintenance, or careless or improper operation.

i. A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

  i. An upset occurred and the Permittee can identify the cause(s) of the upset;
  ii. The permitted facility was at the time being properly operated;
  iii. The Permittee submitted notice of the upset as required under Part II.A.4.e.; and
  iv. The Permittee complied with any remedial measures required under II.A.3.

j. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Part II.A.4.i. are met.

k. In selecting the appropriate enforcement option, the Administrator shall consider whether or not the noncompliance was the result of an upset. The burden of proof is on the Permittee to establish that an upset occurred.

II.A.5. **Removed Substances:** Solids, sludges, filter backwash, or other pollutants removed in the course of control of process wastewaters shall be disposed of in a manner such as to prevent any pollution from such materials from entering any navigable waters.

II.A.6. **Safeguards to Electric Power Failure:** In order to maintain compliance with the effluent limitations and prohibitions of this permit the Permittee shall either:

a. Provide, at the time of discharge, an alternative power source sufficient to operate the wastewater control facilities; or

b. Halt or reduce all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

II.B. RESPONSIBILITIES

II.B.1. **Right of Entry and Inspection:** The Permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials, to:

a. Enter, at reasonable times, upon the Permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit;

b. Have access to and copy any records required to be kept under the terms and conditions of this permit;

c. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations required in this permit; and

d. Perform any necessary sampling or monitoring to determine compliance with this permit at any location for any parameter.

II.B.2. **Transfer of Ownership or Control:** In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the Permittee shall notify the succeeding owner or controller of the existence of this permit, by letter, a copy of which shall be forwarded to the Administrator. The Administrator may require modification or revocation and re-issuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary. The Division shall approve all transfer of permits.

II.B.3. **Availability of Reports:** Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of the Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

II.B.4. **Furnishing False Information and Tampering with Monitoring Devices:** Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained by the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation, or order issued pursuant thereto or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NRS 445A.300 to 445A.730, inclusive or by any permit, rule, regulation, or order issued pursuant thereto is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment. This penalty is in addition to any other penalties, civil or criminal, provided pursuant to NRS 445A.300 to 445A.730, inclusive.

II.B.5. **Penalty for Violation of Permit Conditions:** NRS 445A.675 provides that any person who violates a permit condition is subject to administrative and judicial sanctions as outlined in NRS 445A.690 through 445A.705.

II.B.6. **Permit Modification, Suspension, or Revocation:** After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;

II.B.7. **Toxic Pollutants:** Notwithstanding Part II.B.6., if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent

than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the Permittee so notified.

II.B.8. **Liability:** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal, State, or local laws, regulations, or ordinances.

II.B.9. **Property Rights:** The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, rights, or rights of access or easement; nor does it authorize any injury to private property, any invasion of personal rights, or any infringement of Federal, State, or local laws or regulations.

II.B.10. **Severability:** The provisions of this permit are severable, and if any provision of this permit or the application of any provisions of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

II.B.11. **Need to Halt or Reduce Activity Not a Defense:** The need to halt or reduce permitted activities in order to maintain compliance with the conditions of this permit shall not be a defense for a Permittee in an enforcement action.

II.B.12. **Duty to Provide Information:** The Permittee shall furnish to the Administrator, within a reasonable time, any relevant information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this permit.

PART III

III.A. OTHER REQUIREMENTS

III.A.1. **Signatures, certification required on application and reporting forms**

a. All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification:
"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

b. All applications, reports or other information submitted to the Administrator shall be signed by one of the following:

i. A principal executive officer of the corporation (of at least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility from which the discharge described in the application or reporting form originates; or
ii. A general partner of the partnership; or
iii. The proprietor of the sole proprietorship; or
iv. A principal executive officer, ranking elected official or other authorized employee of the municipal, state or other public facility.

c. **Duly Authorized Representative:** All Discharge Monitoring Reports and any other information required by this permit or requested by the Administrator shall be signed by a person described in paragraph (b) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i. The authorization is made in writing by a person described in paragraph (b) of this section
ii The authorization specifies either an individual or a position having responsibility for environmental matters for the company, and
iii. The authorization is submitted to the Division.

d. **Changes to Authorization:** If an authorization under paragraph c. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph b. of this section must be submitted to the Administrator prior to or together with any reports, information, or applications to be signed by an authorized representative.

III.A.2. **Holding Pond Conditions:** If any wastewater from the Permittee's facility is placed in ponds, such ponds shall be located and constructed so as to:

a. contain with no discharge the 25-year 24-hour storm at said location;

b. withstand with no discharge the 100-year flood of said location; and,

c. prevent escape of wastewater by leakage other than as authorized by this permit.

III.A.3. **Flow Rate Notification:** The Permittee shall notify the Administrator, by letter, not later than ninety (90) days after the 30-day average daily influent flow rate first equals or exceeds 85% of the design treatment capacity of the Permittee's facility given in Part I.A above. The letter shall include:

a. The 30-day average daily influent flow rate;

b. The maximum 24-hour flow rate during the 30-day period reported above, and the date the maximum flow occurred;

c. The Permittee's estimate of when the 30-day average influent flow rate will equal or exceed the design treatment capacity of the Permittee's facility;

d. A status report on the treatment works which will outline but not be limited to past performance, remaining capacity of the limiting treatment and disposal units or sites, past operational problems and improvements instituted, modifications to the treatment works which are needed to attain the permitted flow rate due to changing site specific conditions or design criteria; and

e. The Permittee's schedule of compliance to provide additional treatment capacity before the 30-day average daily influent flow rate equals the present design treatment capacity of the Permittee's facility.

Eldorado-Ivanpah Transmission Project

Public Utilities Commission of Nevada
Utility Environmental Protection Act

PUBLIC UTILITIES COMMISSION OF NEVADA
MEMORANDUM

2011 MAR -4 AM 8:05

DATE: March 2, 2011

TO: The Commission
Via: Anne-Marie Cuneo, DRO AMC
Tammy Cordova, Staff Counsel TC/MC2
Paul Maguire, Manager, Engineering PM

FROM: Jason Woodruff, Electrical Engineer JW/bb MPH
Mark Harris, ARRA, Electrical Engineer

SUBJECT: Agenda 06-11, Item 4A; Docket No. 10-04027, Amended Application of Southern California Edison Company for authority under the provisions of the Utility Environmental Protection Act for a permit to construct the Eldorado-Ivanpah Transmission Project consisting of a 220 kilovolt transmission line and associated upgrades to the Eldorado Substation to connect the new Ivanpah Substation in California to the existing Eldorado Substation located near Boulder City in Clark County, Nevada.

I. Summary

Pursuant to Nevada Revised Statutes ("NRS") 704.820 to 704.900, inclusive, (the "Utility Environmental Protection Act" or "UEPA"), on April 29, 2010, Southern California Edison Company ("SCE") filed with the Public Utilities Commission of Nevada ("Commission") an Initial Application for a Permit to Construct the Eldorado-Ivanpah Transmission Project (the "Project"). The Project is designed to provide SCE with increased substation and transmission line capacity for the provision of interstate transmission service from new generating facilities to be constructed in or near the Ivanpah Valley in southeastern San Bernardino County, California (the "Ivanpah Valley Area") to SCE's existing Eldorado Substation in Clark County, Nevada (the "Eldorado Substation").

Except for two points on the transmission line's proposed route[1], all of the Project will be located on public land under the jurisdiction of the United States Bureau of Land Management ("BLM"), the "appropriate federal agency" as defined by NRS 704.834[2]. Pursuant to NRS 704.870 (2)[3], on

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[1] At one point, the transmission line will use an existing right-of-way on land owned by Boulder City, Nevada. At the other point, the transmission line will use an existing right-of-way on a privately owned parcel of land near Primm, Nevada.

[2] NRS 704.834 defines the "appropriate federal agency" as the "federal agency responsible for the enforcement of environmental laws whose approval is required for the construction of a utility facility."

[3] NRS 704.870(2) provides:
If a person wishes to obtain a permit for a utility facility and a federal agency is required to conduct an environmental analysis of the proposed utility facility, the person must:

December 6, 2010, SCE filed an Amended Application with a copy of the Final Environmental Impact Report/Environmental Impact Statement ("EIR/EIS") jointly prepared by the California Public Utilities Commission ("CPUC")[4] and the BLM. In the Amended Application, SCE requests that the Commission grant a UEPA permit for the Project, with the condition that SCE file any outstanding required permits, licenses or approvals with the Commission prior to commencing construction.

There is no opposition to the Amended Application. The Commission's Regulatory Operations Staff ("Staff") recommends that the Commission issue a compliance order authorizing the issuance of a UEPA permit for the Project upon completion of the filing of the outstanding permits, as set forth herein-below.

Location of the Project

In its entirety, the Project includes: upgrades to the Eldorado Substation, which is located approximately 16 miles southwest of the city of Boulder City, Clark County, Nevada; 35 miles (28 in Nevada and seven in California) of a double-circuit 220 kilovolt ("kV")[5] transmission line (the "Line"), which will replace a portion of an existing SCE 115 kV transmission line and will be located within a BLM right-of-way across federal land in southeastern California and southern Nevada; telecommunication pathways and communication equipment, which will be located within the BLM right-of way; and a new 220/115 kV substation, which will be located in San Bernardino County, California, about seven miles from the California/Nevada border (the "Ivanpah Substation").

(a) Not later than the date on which the person files with the appropriate federal agency an application for approval for the construction of the utility facility, file with the Commission and each other permitting entity an application, in such a form as the Commission or other permitting entity prescribes, containing:

(1) A general description of the proposed utility facility; and

(2) A summary of any studies which the applicant anticipates will be made of the environmental impact of the facility; and

(b) Not later than 30 days after the issuance by the appropriate federal agency of a final environmental assessment or environmental impact statement relating to the construction of the utility facility:

(1) File with the Commission an amended application that complies with the provisions of subsection 1; and

(2) File with each other permitting entity an amended application for a permit, license or other approval for the construction of the utility facility.

[4] On May 28, 2009, SCE filed an Application for a Certificate of Public Convenience and Necessity with the CPUC. The BLM and the CPUC jointly prepared the EIR/EIS in compliance with the National Environmental Policy Act and the California Environmental Quality Act.

[5] The BLM's EIR/EIS addresses the environmental impact of a 230 kV transmission line, which SCE used for modeling purposes. For operating purposes, SCE intends on using a 220 kV line.

The location of the Nevada portion of the Project[6] includes the existing location of the Eldorado Substation, which is approximately 16 miles southwest of the city of Boulder City in Clark County, Nevada and the BLM's right-of-way for the 28-mile portion of the Line, which will run in a north-northwesterly direction from the Eldorado Substation to the Nevada/California border near Primm, Nevada. The location of the California portion of the Project includes the proposed site for the Ivanpah Substation in San Bernadino County, California and the seven-mile portion of the BLM right-of-way between the Ivanpah Substation and the California/Nevada border.

Project Facilities to be Constructed in Nevada

The Eldorado Substation

The upgrades to SCE's Eldorado Substation consist of extending the existing 230 kV switchyard to the west within the existing substation fence, adding two 220 kV line positions at the Substation for the Line and removal of an existing 220/115 kV transformer bank. SCE may also need to upgrade the existing 220 kV circuit breakers and 500 kV series capacitors at the Substation in order to cover the additional fault duty currents that could be generated by the new higher capacity transmission line.

The Line

Each circuit of the Line will consist of aluminum strand steel reinforced conductors. For the entire Line, the conductors will be supported by a total of 258 galvanized steel structures: 216 double-circuit lattice towers up to 118 feet tall, and 42 single-circuit H-frame structures up to 75 feet tall.

Communication Pathways and Communication Equipment

In order to prevent thermal overload and/or voltage collapse of the interstate transmission system due to operation of the Line, the Project includes two separate and identical telecommunication paths for detecting critical component failure. Path 1 calls for the installation of 28 miles of overhead optical ground wire along the Line. Path 2 consists of two sections. Section 1 calls for the installation of 25.5 miles of overhead optical ground wire along the Line; Section 2 calls for a combined optical ground wire and microwave path, which for about two miles along SCE's Eldorado to Logo 500 kV line in Clark County, Nevada will be underground.

Water Use

SCE estimates that approximately 30.6 to 38.8 acre feet will be used for dust control during construction, and it has an agreement with Molycorp Mine Mountain Pass to use up to 40,000 gallons. To limit excessive withdrawal of ground water, Mitigation Measure W-2 in the BLM's EIR/EIS sets maximum limits on water use during construction and operation of the Project.

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[6] In the Initial and Amended Applications and in its description of the Project, SCE did not divide the Project into component parts based on the location of the facilities (i.e., in Nevada or California). As a practical matter, construction of the facilities in California is dependent on construction of the Nevada portion of the facilities and vice versa.

Workforce

SCE's total estimated workforce for the Project is 452 temporary employees during construction. According to SCE, a significant portion of those employees will be from Nevada.

II. Notice and Comments

The Commission issued a Notice of Application on May 10, 2010, with a due date of June 2, 2010, for interested and affected persons to file: 1) notices of intervention pursuant to NRS 704.885(l)(c); 2) petitions for leave to intervene pursuant to NRS 704.885(l)(d); 3) notices of intent to be a party pursuant to NRS 704.885(1); or 4) make a limited appearance in this proceeding pursuant to NRS 704.885(2), by filing a written statement of position on the project. Notice of the Initial Application and the deadline for filing petitions to intervene or comments was published in the Las Vegas Review Journal on May 21, 2010, and the Nevada Appeal on May 23, 2010.

The Commission issued a Notice of Amended Application on December 13, 2010, with a due date of January 5, 2011, for interested and affected persons to file: 1) notices of intervention pursuant to NRS 704.885(l)(c); 2) petitions for leave to intervene pursuant to NRS 704.885(l)(d); 3) notices of intent to be a party pursuant to NRS 704.885(1); or 4) make a limited appearance in this proceeding pursuant to NRS 704.885(2) by filing a written statement of position on the project. Notice of the Amended Application and intervention/comment deadline was published on December 21, 2010, in the Las Vegas Review Journal and on December 26, 2010, in the Nevada Appeal. Locals 357 and 47 of the International Brotherhood of Electrical Workers Local Unions, the Nevada Conservation League, and two companies with solar generating facilities in California (Bright Source Energy Inc. ("BSE") and First Solar) filed comments in support of SCE's request for a UEPA permit for the Project. No other responsive documents were received.

SCE also filed its Initial and Amended Applications, including the BLM's Final EIR/EIS with the Nevada State Clearinghouse ("Clearinghouse"), which forwarded them to the State of Nevada's environmental agencies. In response to the Initial Application, the Nevada Department of Wildlife ("NDOW"), as a participating agency in the Project's EIR/EIS preparation, sent a letter to the Clearinghouse and the BLM, regarding the probable effects of the Project on the desert bighorn sheep, the desert tortoise, the Gila monster, and other wildlife populations. Specifically, the NDOW requested that:

- No helicopter work take place in McCullough Pass during the summer season;
- The road over McCullough Pass remain open for public access during construction;
- NDOW be apprised in timely fashion of road closures during the hunting season for desert bighorn sheep;
- The Project incorporate a non-lattice tower design;
- Raven nests be removed during the nesting season from existing and/or new lattice towers;
- Raven control efforts be implemented during tortoise nesting and when young tortoises are present;

- NDOW's protocols for encounters with the Gila monster should be incorporated into worker education and project monitoring.

The Clearinghouse did not receive any other responses from state environmental agencies regarding the Amended Application and the BLM's EIR/EIS.

III. Staff's Investigation and Analysis

Staff's investigation and analysis of the Initial and Amended Applications reflects the UEPA statutes and, in particular, the pertinent provisions of NRS 704.877 (1), which requires the Commission to accept and incorporate the findings and conclusions in the BLM's EIR/EIS. NRS 704.890 (1) requires the Commission to make certain findings and determinations regarding the environmental effect, need, other required permits, and the public interest, and each of those statutorily required findings are addressed herein below.

NRS 704.890(1)(a): A list of the potential environmental impacts of the Project is provided in Table ES-5 of the Executive Summary in Volume I of the Final EIR/EIS. All of the mitigation measures are set forth in Volume II, Table 9-2, pages 9-6 through 9-66. Briefly summarized, the Final EIR/EIS indentifies a significant and unavoidable adverse impact on the desert tortoise and a temporary impact on air quality during construction. With mitigation, impacts on aesthetics and visual resources will be less than significant. All other impacts were determined to be less than significant or can be reduced to a less-than-significant level with the implementation of the mitigation measures listed in the Final EIR/EIS.

NRS 704.890(1)(b): The Project is not needed to ensure reliable utility service to customers in Nevada. The main purpose of the Project is to create a transmission path for the immediate delivery of 370 MW of renewable energy from the BSE Ivanpah Solar Project (which is located in California) into Nevada, such that the power can be further transmitted on to California via existing transmission infrastructure.[7] There are likely minimal reliability benefits to electric customers in the State of Nevada as a result of the initial Project. However, given that the double circuit 220 kV line proposed to be constructed is expected to have a total of 1,400 MW of transmission capacity, some of that transmission capacity could in the future be used to deliver additional energy (including renewable energy) to Nevada that could be utilized by Nevada Power Company ("NPC") and/or other Nevada entities, and could therefore, provide some degree of increased reliability benefits to electric customers in the State of Nevada. This additional transmission capacity also furthers the Legislature's stated goal of "encourage and accelerate the development of new renewable energy projects and create successful markets for electricity generated by those projects using the abundant and diverse renewable energy resources available in Nevada." Chapter 2, Statutes, 2005, 22nd Special Session.

NRS 704.890(1) (c): The Project is needed initially to facilitate the interconnection and transmission of electricity generated by BSE's 370 MW Ivanpah Solar Electric Generating System Project and for the provision of reliable transmission service for up to 1,400 MWs in or near the Ivanpah Valley on the interstate transmission grid. In light of (a) the need for the

[7] BSE's power purchase agreement is with Pacific Gas and Electric ("PG&E").

Project in order to provide reliable interstate transmission service for new generating facilities (most of which will use a renewable source of energy), and (b) the BLM's determination that (except for the "No-Action Alternative," which would not meet the Project's objectives) the Project is the "environmentally superior alternative," the need for the Project balances any adverse effect on the environment, as determined by the BLM.

NRS 704.890(1) (d): The BLM's EIR/EIS finds and concludes that the Project is the "environmentally superior alternative," and it represents the minimum adverse impact on the environment considering the state of available technology and the nature and of the various alternatives.

NRS 704.890(1) (e): According to the Amended Application, SCE is in the process of obtaining the following "other" federal, state and local permits:

1) BLM Right of Way ("ROW") Grant;
2) BLM Notice to Proceed;
3) BLM ROD;
4) Endangered Species Act – Section 7 Consultation between BLM and U.S. Fish & Wildlife Service;
5) US Army Corps of Engineers – Clean Water Act 404 Permit;
6) Federal Aviation Administration ("FAA")– Hazard/No Hazard Determination;
7) Nevada Department of Transportation ("NDOT") – Telecommunication Encroachment Permit;
8) Nevada Division of Environmental Protection ("NDEP") Water Pollution Control Board – National Pollutant Discharge Elimination Permit or Report of Waste Discharge;
9) Clark County Department of Comprehensive Planning – Special Use Permit;
10) Clark County Department of Air Quality Management – Dust Control Permit; and
11) Clark County Department of Developmental Services – Grading Permit.

In addition, SCE needs to obtain an order from the CPUC that grants SCE's application for a certificate of public convenience and necessity for the Project.

NRS 704.890(1)(f): The Project will serve the public interest. It will provide transmission capacity for the development and delivery of 370 MW of renewable energy, and potentially future additional renewable energy, in California and will thereby provide assistance to PG&E to meet the California Renewable Energy Portfolio. This additional transmission capacity also furthers the Legislature's stated goal of "encourage and accelerate the development of new renewable energy projects and create successful markets for electricity generated by those projects using the abundant and diverse renewable energy resources available in Nevada." Chapter 2, Statutes, 2005, 22nd Special Session. Additionally, during construction, the Project will provide temporary employment to Nevada residents, and since 28 miles of the Line will be located in Nevada, it will provide some additional revenues to local tax authorities.

IV. Conclusion and Recommendations

The Initial and Amended Applications in Docket No. 10-04027 have been properly noticed. The need for the Project, the BLM's findings and conclusions, and the public interest support the issuance of a UEPA permit for construction of the Nevada portion of the Project. In light of the other permits, licenses and approvals required by federal, state and local statutes, regulations and ordinances that SCE has not yet obtained, **Staff recommends that the Commission issue a Compliance Order approving the Amended Application, contingent upon SCE obtaining the following permits:**

1) **BLM ROW Grant;**
2) **BLM Notice to Proceed;**
3) **BLM ROD;**
4) **Endangered Species Act – Section 7 Consultation between BLM and U.S. Fish & Wildlife Service;**
5) **U. S. Army Corps of Engineers – Clean Water Act 404 Permit;**
6) **FAA – Hazard/No Hazard Determination;**
7) **NDOT – Telecommunication Encroachment Permit;**
8) **NDEP Water Pollution Control Board – National Pollutant Discharge Elimination Permit or Report of Waste Discharge;**
9) **Clark County Department of Comprehensive Planning – Special Use Permit;**
10) **Clark County Department of Air Quality Management – Dust Control Permit;**
11) **Clark County Department of Developmental Services – Grading Permit; and**
12) **CPUC Certificate of Public Convenience and Necessity.**

Once SCE has obtained these permits, licenses and approval and has filed them with the Commission, with a copy to Staff, for compliance review, Staff recommends that the Commission's Secretary issue a "Permit to Construct" to Southern California Edison Company for construction of the Eldorado-Ivanpah Transmission Project, including upgrades to the Eldorado Substation, a 220 kilovolt ("kV) transmission line, access roads for the same, and telecommunication paths at locations within Clark County, Nevada, described in more detail as follows:

> Construction of upgrades at the Eldorado Substation, which is located on portions of Sections 1, 2, 11 and 12 of Township 25 South, Range 62 East, M.D.M. Clark County, Nevada (14 miles west of Boulder City, Nevada).
>
> Construction of a 220 kV transmission line, Telecommunication Path 1, and access roads for the same (the "Line"), commencing at the Eldorado Substation and running generally west to Primm, Nevada, and then on to the Ivanpah Substation in California. More specifically, the Line will be located on portions of Sections 3, 4, 8 and 9 of Township 27 South, Range 59 East; Sections 12, 13, 23, 24, 26, 34, 35, of Township 26 South, Range 59 East; Sections 3, 4, 5, 6, 7, and 8 of Township 26 South, Range 60 East; Sections 24, 25, 26, 34, and 35 of Township 25 South, Range 60 East; Sections 19, 20, 21, 22, 23, 24

and 30 of Township 25 South, Range 61 East; Sections 2, 3, 4, 8, 9, 17, 18, and 19 of Township 25 South, Range 62 East, M.D.M., Clark County, Nevada.[1]

Construction of Telecommunication Path 2 on portions of Sections 25 and 26 of Township 28 South, Range 60 East; Sections 2, 10, 11, 15, 16, 20, 21, 29 and 30 of Township 28 South, Range 61 East; Sections 25, 35, and 36 of Township 27 South, Range 61 East; Sections 6, 7, 18, 19, and 30 of Township 27 South, Range 62 East; Sections 4, 8, 9, 17, 20, 29, 30, and 31 of Township 26 South, Range 62 East; and Sections 11, 14, 22, 23, 27, 33, and 34 of Township 25 South, Range 62 East, M.D.M. Clark County, Nevada.

Staff also requests that the Commission include an ordering paragraph in its Compliance Order which states: "No construction may commence on any utility facilities in Nevada that are the subject of SCE's Amended Application for a UEPA Permit to Construct until after the Commission has issued the Permit to Construct."

Staff further recommends that the Commission's Compliance Order reflect the following findings and conclusions:

1) The BLM has already conducted an environmental review of the Project, including the portion of the Project that will be constructed in Nevada, and the Commission accepts and incorporates by reference the findings and conclusions made by the BLM in the EIR/EIS issued on November 5, 2010.
2) The Project is not needed to ensure reliable utility service to customers in Nevada.
3) The need for the Project, including the portion to be constructed in Nevada, balances any adverse impact on the environment, as set forth in the BLM's EIR/EIS.
4) As found in BLM's EIR/EIS, the Project, including the Nevada portion, is the environmentally superior alternative and represents the minimum adverse effect on the environment, considering the state of available technology and the nature and economics of the various alternatives.
5) That the Project will serve the public interest.
6) SCE has not obtained all of the other permits, licenses, and approvals required by federal, state and local statutes, regulations and ordinances prior to commencement of construction of the Project, and a UEPA permit shall be issued upon SCE obtaining the outstanding permits and approvals as listed in SCE's Amended Application filing them with the Commission, with a copy served on Staff.

[1] These areas include proposed pulling/splicing and tensioning sites for the Project, as well as construction staging sites and helicopter landing zones. These descriptions do not include the portion of the Project located in California.

Eldorado-Ivanpah Transmission Project

Utility Environmental Protection Act
Permit to Construct

Anticipated Submittal Date: 11/30/2011

Eldorado-Ivanpah Transmission Project

Stormwater General Permit
Nevada Division of Environmental Protection – Permit NVR100000

ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
Colleen Cripps, Ph.D., Administrator

9/16/2011

MR. JOHN SLAYTON
SOUTHERN CALIFORNIA EDISON
8631 RUSH STREET
ROSEMEAD, CA 91770

Dear: MR. JOHN SLAYTON

Re: Stormwater General Permit: NVR100000

Project ID Number: CSW-22519

Project Name: EITP Telecommunication Construction Activities

Your submittal to be included under the Stormwater General Permit has been approved effective 09/16/2011 . Please note that by submitting an NOI the permittee has certified that the project's Storm Water Pollution Prevention Plan (SWPPP) has been completed, that the SWPPP will be updated as necessary, and that it will be maintained at the permitted site.

At the time of any on-site inspections, our Inspectors will ask to review your copy of the SWPPP in an effort to ensure proper compliance with the program.

Also note that Nevada Administrative Code (NAC) 445A.268 Section (5)(b) reads, in part, that a Permittee (discharger) who is covered under a general permit shall pay to the Director a nonrefundable fee of $200 not later than July 1 of each year that the discharger is covered under that permit.

To Terminate coverage of the Nevada NPDES General Permit for Stormwater Discharges, the Permittee must submit a Notice of Termination ("NOT") form when their facilities no longer have any stormwater discharges associated with Construction activity as defined in the Nevada's General Stormwater Permit or EPA regulations at 40 CFR 122.26, or when they are no longer the operator of the site.

Should you have any questions, I can be reached at (775) 687-9434.

Sincerely,

Michele Reid
Environmental Scientist
Stormwater Program
Nevada Division of Environmental Protection

CC: Mr.John Slayton Southern California Edison 8631 Rush Street Rosemead CA 91770

Eldorado-Ivanpah Transmission Project

Appendix B5 – Nevada Local Permits

Dust Control Permit - 230 Line Installations – Clark Count Permit 40367

Dust Control Permit - Staging Areas – Clark Count Permit 40364

Dust Control Permit - Access Roads – Clark Count Permit 40363

Dust Control Permit – Fiber Optic Stringing – Clark Count Permit 40395

Dust Control Permit – Fiber Optic UC – Clark Count Permit 40394

Dust Control Permit - Subtransmission – Clark Count Permit 40377

Special Use Permit Clark County - Dept of Comprehensive Planning UC-0553-10

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

Eldorado-Ivanpah Transmission Project

Dust Control Permit

230 Line Installations – Clark County

Permit 40367

Air Quality & Environmental Management

500 S. Grand Central Parkway, 1st floor
Las Vegas NV · 89155-1776
(702) 455-5942 · Fax (702) 383-9994

40367-0-1

CLARK COUNTY • LAS VEGAS • NORTH LAS VEGAS • BOULDER CITY • HENDERSON • MESQUITE

DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES INCLUDING SURFACE GRADING AND TRENCHING

THIS PERMIT DOES NOT EXEMPT THE PERMITTEE FROM COMPLIANCE WITH THE ENDANGERED SPECIES ACT

Permit Number: **40367** **Mod: 0**

PAYMENT INFORMATION: 20112540

Fee: **$35,000.00**

Balance Due: $ 0

Permittee and Project Information

Permittee:	**Southern California Edison**
Permittee Address:	**1218 South Fifth Avenue**
City, State, Zip:	**Monrovia CA 91016** Fax No.:: **6264622774**
Project Name:	**EITP - 230 kV Transmission Line**
Project Address:	**Highway 95 to Interstate 15**
Located In:	*Township:* **25** *Range:* **62** *Section:* **1** EO Area: **SE/SW**
Acreage This Mod:	**250** Total Acreage: **250**
Cross Streets:	**Highway 95 to Interstate 15**

Project Contact(s)

Normal Hours:	**Kirk Riehl**	After Hours:	**Arnel "A.L." Wilson**
Company:		Company:	**Southern California Edison**
Phone:	**(714)814-5643**	Phone:	**(626)302-3174**

Issue Date: **13-Sep-2011** **Expiration Date:** **13-Sep-2012**

Effective Date: _____

Notes

ATC

- ○ Request Of Sign Waiver
- ○ Public Works Agreement
- ○ Closure Plan
- ○ Conditional Renewal

DUST CONTROL MEASURES MUST OCCUR 24 HOURS A DAY, 7 DAYS A WEEK

THIS PERMIT IS NOT VALID UNTIL ALL FEES ARE PAID IN FULL AND A COMPLETE COPY IS ON THE PROJECT SITE, INCLUDING CONDITIONS OF PERMIT AND DUST MITIGATION PLAN

It is a condition of the issuance of any operating permit required by the commission or pursuant to any local ordinance for the control of air pollution that the holder of the operating permit agrees to permit inspection of the premises to which the permit relates by any authorized officer of the department at any time during the holder's hours of operation without prior notice. This condition must be stated on each application form and operating permit. NRS 445B.580.

The issuance of this PERMIT does not relieve the PERMITTEE from compliance with all other applicable federal, state, county and local ordinances and regulations. Issuance of this PERMIT shall not be a defense to violations of any applicable ordinances or regulations.

DAQEM Use Only

RECEIVED
CC-DAQM

2011 AUG 25 A 8:58

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

APPLICATION
DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. **Applicant/Permittee:**

☑ Property Owner ☐ Developer ☐ Prime Contractor ☐ Other _____

Name: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

E-mail Address: Project Manager: roger.~~shultz~~Schultz@sce.com; AQ: arnel.wilson@sce.com

2. **Project:**

Name: EITP - 230 kV Transmission Line

Address: _____ City: _____

Nearest major cross-streets: Highway 95 to Interstate 15

Township(s): 25 Range(s): 62 Section(s): 1

Assessor's Parcel number(s) (Attach map): 214 00 001 021

Project Description: Tower installation for new 230 kV transmission line, includes pulling

Project Acreage: 250.0 acres (rounded to the nearest 0.1 acre, all land that will be disturbed must be included in project acreage)

Permit fees: If the project acreage listed above contains a faction, the project acreage will be rounded up to the next whole number for fee purposes. The rounded up acreage (quantity) value will be used to assess the acreage fee for this permitting action.

Submit the total permit fee, with this application. Permit fees are non-refundable.

You must select one of the following three choices.

☐ This project does not require any offsite street or utility development.

☐ This project requires offsite street/utility development that is not included in this application, and will be added at a later date by modification or additional permit.

☑ This application includes offsite street/utility development. (Area must be marked on the accompanying parcel map. Check all that apply)

Utility Lateral ☑ less than 100 ft. ☐ greater than 100 ft. ☑ Half Street ☐ Full Street

☑ Curb / Entrance ☐ Entity Name and Number of Approved Offsite Plan / Permit / Easement: _____ ☐ Plan Pending ☐ Other

3. **Property Owner (if not applicant):**

Name: _____

4. **Point of Contact for dust control matters and to whom a NOTICE OF VIOLATION should be sent if necessary:**

Name: Arnel "A.L." Wilson Company: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

Cellular/Pager: (626) 302-3174 After Hours Phone: (714) 915-1525

5. **On-site Superintendent/Supervisor/Foreman contact:**

Name: Kirk ~~Real~~ Riehl Company: _____

On-site phone: (714) 814-5643 Cellular/Pager: (714) 814-5643

DAQEM Dust Class Certification/Card #: DC 0510150 Expiration date: 5-28-13

Have all other on-site supervisory personnel attended the DAQEM Dust Class? ☐ Yes ☒ No

If no, all on-site supervisory personnel must attend a DAQEM Dust Class within 30 days.

7. **By signing this permit application I certify that:**

A. **I am authorized, on behalf of the individual or company listed in Section 1, as Applicant/Permittee, to apply for their Dust Control Permit and to commit to all of the terms and conditions of the requested permit.**

B. **Construction activities will be limited to lands that the applicant/permittee either owns or is authorized to use for construction activities. The permit issued subsequent to this application is not a substitute for obtaining the property owners permission to use his land. Issuance of a Dust Control Permit is intended only for the purpose of controlling emissions of air pollutants and assuring compliance with Air Quality Regulations. The applicant/permittee agrees to hold harmless, indemnify, and defend Clark County, its employees and assigns from any claims that may arise due to any unauthorized use of land for construction activities.**

C. **The permittee accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this permit, comply with the terms and conditions of the permit, the dust mitigation plan and all applicable Air Quality Regulations.**

D. **The applicant/permittee understands that it is a condition of the permit that the permittee agrees to allow the inspection of the site for compliance with the terms and conditions of the permit and Air Quality Regulations at any time during the permittee's hours of operation by a DAQEM officer without prior notice or at any time pursuant to the investigation of a complaint or upon direct observation of emission and/or failure to maintain Best Management Practices.**

E. **I understand that any material misrepresentation made in this application may invalidate the permit and that Clark County may pursue enforcement action against me. In addition, I understand any willful misrepresentation may result in criminal penalties. I declare under penalty of perjury that the foregoing is true and correct.**

Executed on:

August 23, 2011 _____

DATE SIGNATURE

Arnel L. Wilson Air Quality Specialist, SCE

PRINTED NAME TITLE AND COMPANY NAME

Application completed by, if not completed by signatory (Please Print):

Name _____ Phone Number _____ Ext. _____

PAYMENT INFORMATION **TO BE COMPLETED BY THE APPLICANT**

PAYING BY **(Please Print)**

☐ CASH

☑ CHECK CHECK # 0041194704
NAME AND ADDRESS AS IT APPEARS ON CHECK:
So. Calif Edison
PO Box 700
Rosemead, Ca 91770
Telephone #: _____

☐ CREDIT CARD LAST FOUR DIGITS OF CREDIT CARD NUMBER: _____
EXACT NAME AS IT APPEARS ON CREDIT CARD:
_____

FOR DAQEM USE ONLY

9/13/2011 ISSUE DATE | JS 40367 ISSUED BY | 20112540 POS #

8/25/11 DATE PAID | RECEIVED BY

DAQEM REVIEW: _____ DATE: 9.18.11

BLASTING APPROVAL (if applicable): _____ DATE: _____

DEMOLITION APPROVAL (if applicable): _____ DATE: _____

COMPLIANCE AREA ASSIGNMENT: SE & SW Hydrographic Area: 167 - Eldorado Valley

☐ Airport ☐ Blasting ☐ Commercial ☐ Demo-Structure ☐ Demo–Other ☐ Staging/Stockpiling
☐ Highway ☐ Schools ☐ Residential ☐ Public Works ☐ Flood Detention ☐ Utilities ☑ Misc.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Arnel L. Wilson
Southern California Edison
1218 South Fifth Avenue
Monrovia, CA 91016
August 23, 2011

Clark County
Department of Air Quality and Environmental Management
500 S. Grand Central Parkway
Las Vegas, NV 89155

Attention: Jennifer Lipkin

RE: Supplement to the Dust Mitigation Plan for EITP – 230- kV Line.

This letter is written as a supplement to the Dust Mitigation Plan for the Eldorado-Ivanpah Transmission Project (EITP) – 230-kV Line.

Project Description

A new double-circuit 230-kV transmission line, approximately 35 miles long, would be constructed between the existing Eldorado Substation in Nevada and the proposed Ivanpah Substation in California. Approximately 29 miles of the 35 mile line would be located within Nevada.

Structures include:

- Lattice Steel Towers (LSTs), which consist of a steel framework that is bolted or welded together;
- Tubular Steel Poles (TSPs), which are hollow steel poles consisting of two or more sections slip-jointed together.
- H-frame Structures, which can be constructed with a lattice steel structure or with tubular steel.

Pulling/stringing sites: The pull sites are locations where equipment is set up for pulling the conductors and static wires. The stringing of conductor and overhead communication/groundwire on a new transmission line typically commences once a sufficient number of structures have been erected and inspected. Stringing equipment locations would be in line with the tower line, temporarily set up between towers or on the outside of the tower line. These areas would be approximately 500 feet by 150 feet in size.

A total of approximately 250 acres will be disturbed from the tower sites and the pulling and stringing areas to construct the new 230-kV line.

Expenditure towards dust control for the proposed project is anticipated to be approximately $25 million.

2244 Walnut Grove Ave.
Rosemead, CA 91770

Site Plan

According to the draft construction schedule, installation of structures would take place between June of 2012 and June of 2013. Pulling would take place between January of 2013 and August of 2013. Stringing would take place between February 2012 and April 2012. Conductor splicing would take place between May 2013 and July 2013.

Please refer to the Eldorado-Ivanpah Transmission Line Road Story for tower locations, pulling and stringing areas, and aerial photos.

Additional Explanation of Control Measures

Dust control measures include:

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area.
- Pre-watering of soils prior to clearing and trenching.
- Pre-moistening of, prior to transport, import and export dirt, sand or other loose materials.
- Dedication of water truck or high-capacity hose to any soil screening operations
- Minimization of drop height of material through screening equipment
- Reduction of the amount of disturbed area where possible
- Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan.

Contingency

Contingency measures include the utilization of one 24-hour, on-call person for fugitive dust measure. Upon discovery of any inadequacies, more frequent application procedures will be exercised, and/or dust suppressants will be utilized according to BLM guidelines.

Soil Stabilization Measures

Disturbed soil will be stabilized with the utilization of water applied via water truck periodically throughout the workday. A final application will be applied at the end of the day, with an amount sufficient to maintain a surface crust. Daily records of dust control measures will be maintained.

Employee Dust Control Training and Compliance

The contractor for this portion of the project has not yet been selected. However, once the contractor has been selected, all site supervisors/manager and water truck drivers will be required to complete the DAQEM Dust Control Training and their names and

certification numbers will be provided to you. Once the on-site Dust Control Monitor has been selected, form DCP09: Construction Site Dust Control Monitor will be completed and submitted.

Sincerely,

Arnel L. Wilson
Air Quality Specialist

Protecting the air we share

Air Quality

DUST MITIGATION PLAN FOR ALL PROJECTS

Project Name: EITP - 230 kV Transmission Line

Permittee Name: Southern California Edison

Identify the Project Soil "Particulate Emission Potential" (check all that apply):

Using silt and optimum moisture content to determine the particulate emission potential (PEP) is the preferred method.

☑ PEP determined using generalized PEP determination maps included in the Dust Control Handbook.

☐ PEP determined using silt vs. optimum moisture table in Figure 2 of the Dust Control Handbook.

Percentage of silt through a #200 sieve: ___% Optimum moisture content: ___%

PEP for this project is determined to be:

☑ High ☐ Moderate High ☑ Moderate Low ☐ Low

High in lieu of DC812

Water source: ☐ Hydrant with Jones Valve ☐ Fire hose ☑ Water trucks/pulls ☐ Well ☑ Stand tanks ☐ Ponds ☐ Other:_____

PROJECT ACTIVITIES CHECKLIST

Instructions:

Place a check mark in the box to the right of each Project Activity that will occur on your project. If additional soil disturbing activities that are not on the checklist are to be included in the project, list them on a separate page and provide a description. For a more complete description of the listed activities, see the Control Measures Selection Pages (Form DCP03) that follow or refer to the Best Management Practices for dust control in the Dust Control Handbook.

BMP 10 Disturbed Soil and BMP 20 Trackout Prevention and Cleanup must be marked for every Dust Mitigation Plan.

CONTROL MEASURES SELECTION PAGES

Instructions:

For each project activity that you have selected on the Project Activities Checklist you must include the corresponding Control Measures Selection Page. Read and understand each item listed as a "Requirement" on these included pages. Where control measure options are listed, place a check in the box in front of the control measure you will use to meet that requirement. You must select at least one control measure where a choice is listed. In addition you must select the control measure that corresponds to your PEP as listed above, if applicable.

NOTE: PROJECTS 10 ACRES AND LARGER MUST COMPLETE A SUPPLEMENT TO THE DUST MITIGARTION PLAN (APPENDIX B-1 AND B-2).

Protecting the air we share

Air Quality

PROJECT ACTIVITIES CHECKLIST

Project Name: EITP - 230 kV Transmission Line

Permittee Name: Southern California Edison

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY COMPLETE THE CORRESPONDING CONTROL MEASURES SELECTION PAGE AND INCLUDE WITH APPLICATION.

BMP	Project Activity	Check All That Apply
01	Backfilling Filling area previously excavated or trenched.	☐
02	Blasting - Abrasive Sandblasting and/or abrasive blasting.	☐
03	Blasting Soil & Rock Explosive blasting of soil and rock.	☐
04	Clearing & Grubbing Clearing and grubbing for site preparation and vacant land cleanup.	✓
05	Clearing Forms, Foundations and Slabs Clearing and cleaning of forms, foundations and slabs prior to pouring concrete.	✓
06	Crushing Crushing of construction and demolition debris, rock and soil.	☐
07	Cut and/or Fill Cut and/or fill soils for site grade preparation.	☐
08	Demolition - Implosion Implosive demolition of a structure, using explosives.	☐
09	Demolition - Mechanical/Manual Mechanical and manual demolition of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls and/or removal of transit pipe	☐
10	Disturbed Soil **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Disturbed soil throughout project including between structures.	✓
11	Disturbed Land - Long Term Stabilization Large tracts of disturbed land that will not have continuing activity for more than 30 days.	✓
12	Dust Suppressants - Selection and Use Selection and use of chemical and organic dust suppressing agents and other dust palliatives.	☐
13	Importing/Exporting Materials Importing or exporting of soil, aggregate, decorative rock, debris, Type II and other bulk material.	✓
14	Landscaping Installation of sod, decorative rock, desert or other landscape material.	☐
15	Paving/Subgrade Preparation Subgrade preparation for paving streets, parking lots, etc.	☐
16	Sawing/Cutting Material Sawing or cutting materials such as concrete, asphalt, block or pipe.	☐
17	Screening Screening of rock, soil or construction debris.	☐
18	Staging Areas Staging areas, equipment storage, vehicle parking lots, and material storage areas.	✓
19	Stockpiles Stockpiling of materials, such as Type II, other soils, rock or debris, for future use or export.	☐
20	Trackout Prevention and Cleanup **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Prevention and cleanup of mud, silt and soil tracked out onto paved roads.	✓
21	Traffic - Unpaved Routes and Parking Construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.	✓
22	Trenching Trenching with track or wheel mounted excavator, shovel, backhoe or trencher.	☐
23	Truck Loading Loading trucks with materials including construction and demolition debris, rock and soil.	✓

EITP - 230 kV Transmission Line

CLEARING AND GRUBBING — BMP 04

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 04-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 04-2 Apply and maintain a dust palliative on surface soils where support equipment and vehicles will operate.

Requirement: Stabilize soil during clearing and grubbing activities.

- ☑ 04-3 **L & ML:** Apply water during clearing and grubbing activities.
- ☐ 04-4 **MH:** Apply water and tackifier mixture during clearing and grubbing activities.
- ☑ 04-5 **H:** Apply water and surfactant mixture during clearing and grubbing activities.

Requirement: Stabilize disturbed soil immediately after clearing and grubbing activities.

- ☑ 04-6 Water disturbed soils to form crust immediately following clearing and grubbing activities.
- ☐ 04-7 Apply and maintain a dust palliative on disturbed soils to form crust immediately following clearing and grubbing activities.

Recommendations: Maintain live perennial vegetation and desert pavement where possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - 230 kV Transmission Line

CLEARING FORMS, FOUNDATIONS AND SLABS — BMP 05

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible emissions to no more than an average of 20% opacity for any period aggregating 3 minutes in any 60-minute period pursuant to Air Quality Regulations.

- ☑ 05-1 Use single stage pours, unless prohibited by engineering design or building code, to minimize clearing.

Note: At least one of the following must be selected.

- ☑ 05-2 Use water spray to clear forms, foundations and slabs.
- ☐ 05-3 Use sweeping and water spray to clear forms, foundations and slabs.
- ☐ 05-4 Use industrial vacuum to clear forms, foundations and slabs prior to the use of high pressure air to blow soil and debris.
- ☐ 05-5 Use industrial vacuum to clear forms, foundations and slabs.

Recommendations: Verify Building Code Restrictions for use of water on slabs.

Avoid use of high pressure air to blow soil and debris from forms, foundations and slabs.

EITP - 230 kV Transmission Line

DISTURBED SOIL — BMP 10

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.

Requirement: Limit vehicle traffic and disturbance of soils where possible.

☑ 10-1 Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

Requirement: Stabilize and maintain stability of all disturbed soil throughout construction site.

Note: You must choose one or more of the following.

☑ 10-2 Apply water to stabilize disturbed soils. Soils must be kept in a sufficiently damp, crusted or covered condition.

☐ 10-3 Apply and maintain a dust palliative based on soil type and future plans.

Requirement: Soil conditions, including preventive and corrective measures, must be recorded every day the construction project is active.

☑ 10-4 Record soil conditions and dust control actions in daily project records.

Recommendations: If interior block walls are planned, install as early in the construction as possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - 230 kV Transmission Line

DISTURBED LAND – Long-Term Stabilization — BMP 11

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize soil to meet standards required by Air Quality Regulation Section 90.

- ☑ 11-1 Apply and maintain a dust palliative on disturbed soils for long-term stabilization. contingency
- ☐ 11-2 Stabilize disturbed soil with vegetation for long-term stabilization.
- ☐ 11-3 Pave or apply surface rock for long-term stabilization.
- ☐ 11-4 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☑ 11-5 Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization.

Requirement: Prevent access to limit soil disturbance.

- ☑ 11-6 Prevent access by fencing, ditches, vegetation, berms or other suitable barrier or means approved by the Control Officer.

Recommendations: Plant perimeter vegetation early. Use of native and drought-tolerant plants with greater than 50 % silhouette area is encouraged.

See also: BMP 12: DUST SUPPRESSANT, DUST PALLIATIVE AND SURFACTANT – Selection and Use.

EITP - 230 kV Transmission Line

IMPORTING/EXPORTING SOIL, ROCK AND OTHER BULK MATERIAL — BMP 13

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 13-1 Apply water and limit vehicle speeds to 15 mph on the work site.
- ☐ 13-2 Apply and maintain dust suppressant on haul routes.

Requirement: Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage.

Requirement: Maintain 3-6 inches of freeboard to minimize spillage.

Requirement: Stabilize materials during transport on site.

- ☐ 13-3 Use tarps or other suitable enclosures on haul trucks.
- ☑ 13-4 Stabilize materials with water.

Requirement: Clean wheels and undercarriage of haul trucks prior to leaving construction site.

Recommendations: Verify State and local laws, concerning the hauling of bulk materials on public roadways.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP.

BMP 23: TRUCK LOADING.

EITP - 230 kV Transmission Line

STAGING AREAS — BMP 18

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 18-1 Limit vehicle speeds to 15 mph in the staging area and on all unpaved access routes.
- ☐ 18-2 Apply and maintain dust suppressant on all vehicle traffic areas in the staging areas and unpaved access routes.

Requirement: Stabilize staging area soils during use.

- ☑ 18-3 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 18-4 Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.

Requirement: Stabilize staging area soils at project completion.

- ☐ 18-5 Apply a dust palliative.
- ☑ 18-6 Apply screened or washed Type II aggregate.
- ☐ 18-7 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☐ 18-8 Pave with thin paving.
- ☐ 18-9 Completed project will cover staging area with buildings, paving, and/or landscaping.
- ☐ 18-10 Apply water to form adequate crust and prevent access.

Recommendations: Limit size of staging areas.

Limit ingress and egress points.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP

EITP - 230 kV Transmission Line

TRACKOUT PREVENTION AND CLEANUP — BMP 20

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: In soils that have a PEP classification of "High", pave construction activities roadways as early as possible.

Requirement: Use of soil to create a ramp for vehicle access over a curb is prohibited.

Requirement: Trackout conditions, including preventive and corrective measures, must be recorded daily for every day that the construction project access is used by vehicles.

☑ 20-1 Record soil conditions and dust control actions in daily project records.

Requirement: Prevent dust from trackout.

☐ 20-2 Immediately clean trackout from paved surfaces to maintain dust control. Trackout must not extend 50 feet or more.

☑ 20-3 Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. Trackout must not extend 50 feet or more and must be cleaned daily, at minimum.

Requirement: Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or travel routes intersect.

☐ 20-4 Install gravel pad(s) consisting of 1" to 3" rough diameter, clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.

☐ 20-5 Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.

☐ 20-6 Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.

☑ 20-7 Install wheel shakers in the event that trackout cannot be controlled with gravel pads.

☐ 20-8 Install wheel washer in the event that trackout cannot be controlled with gravel pads and wheel shakers.

☐ 20-9 Motorized vehicles will only operate on paved surfaces.

(Continued on next page)

Requirement: All exiting traffic must be routed over selected trackout control device(s).

☑ 20-10 Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).

☐ 20-11 Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.

EITP - 230 kV Transmission Line

TRAFFIC – Unpaved Routes and Parking Areas — BMP 21

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT.
PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 21-1 Limit vehicle speeds to 15 mph on all unpaved routes and parking areas.
- ☐ 21-2 Apply and maintain dust palliative on all vehicle travel areas.

Requirement: Stabilize all haul routes.

- ☑ 21-3 Apply water to haul routes and maintain in a stabilized condition.
- ☐ 21-4 Apply a dust palliative to haul routes and maintain in a stabilized condition.
- ☐ 21-5 Apply gravel to haul routes and maintain in a stabilized condition.
- ☐ 21-6 Supplement dust palliative or aggregate applications with watering, if necessary.

Requirement: Stabilize all off-road and parking areas.

- ☑ 21-7 Apply water to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-8 Apply gravel to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-9 Apply recycled asphalt (or other suitable material) to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-10 Apply and maintain a dust palliative (designed for vehicle traffic) to off-road traffic and parking areas and maintain in a stabilized condition.

Recommendations: Use of bumps or dips for speed control is encouraged.

Apply paving as soon as possible to all future roadway areas for PEP categories other than "High".

EITP - 230 kV Transmission Line

TRUCK LOADING

BMP 23

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Ensure all loads are covered prior to leaving the construction site and traveling on public roadways.

Requirement: Stabilize surface soils where loaders, support equipment and vehicles will operate.

- ☑ 23-1 Pre-water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate.
- ☐ 23-2 Apply and maintain a dust palliative on surface soils where loaders, support equipment and vehicles will operate.

Requirement: Stabilize material during loading.

- ☑ 23-3 Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping.

Note: You must selected 23-3 if PEP is greater than LOW, in addition one of the following must be selected.

- ☐ 23-4 **L & ML:** Mix material with water prior to loading.
- ☑ 23-5 **L & ML:** Spray material with water while loading.
- ☐ 23-6 **MH:** Mix material with a water and tackifier mixture prior to loading.
- ☐ 23-7 **MH:** Spray material with a water and tackifier mixture while loading.
- ☐ 23-8 **H:** Mix material with a water and surfactant mixture prior to loading.
- ☑ 23-9 **H:** Spray material with a water and surfactant mixture while loading.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

CONSTRUCTION ACTIVITIES DUST CONTROL PERMIT SUPPLEMENTAL PERMITS/APPROVALS CHECKLIST

The following construction activities require permits or approval in addition to a Dust Control Permit. Permits or approvals must be obtained prior to conducting the activity. This form must be submitted with every Dust Mitigation Plan. *Check all activities that apply to the construction project.*

Activities requiring a Portable Source Permit:
(Comply with Portable Source requirements prior to installing this equipment on the project site.)

Operation of a: List Name of Company and/or Permit #

- ☐ powered crusher at temporary locations. _____
- ☐ powered screen at temporary locations. _____
- ☐ concrete batch plant at temporary locations. _____
- ☐ asphalt batch plant at temporary locations. _____

Activities requiring Supplemental Permit:
(Submit applicable supplemental forms. Asbestos survey is required for any size demo/remodel. NESHAP notification is required for ANY size demolition or for remodel if RACM is found.)

- ☐ Blasting to fracture rock, hardpan, or caliche.
- ☐ Blasting to implode a structure.
- ☐ Demolition of a structure greater than 1,000 square feet.
  - ☐ Structural remodeling
  - ☐ Structure relocation

Activities requiring Authority to Construct (ATC) Certificate and Operating Permit:
(An ATC must be obtained prior to installation of this equipment/facility.)

- ☐ Construction of or installation of any Emission Unit
  - ☐ Gasoline Dispensing Facility
  - ☐ Cooling Tower
  - ☐ Dry Cleaning Equipment
  - ☐ Plating Shop
  - ☐ Incinerator
  - ☐ Boiler
  - ☑ Emergency Standby Generator or Other Internal Combustion Engine
  - ☐ Woodworking Process Equipment
  - ☑ Power Generation Facility or Equipment
  - ☐ Crushing or Screening Stationary Source
  - ☐ Concrete or Asphalt Plant Stationary Source
  - ☐ Commercial Surface Coating Equipment including Paint Spray Booth
  - ☐ Other Source of PM_{10}, CO, VOC, NO_x, SO_2, Lead, Hazardous Air Pollutant, or Toxic Chemical Substance

- ☐ Activities Listed Above Do Not Apply to this Construction Project:

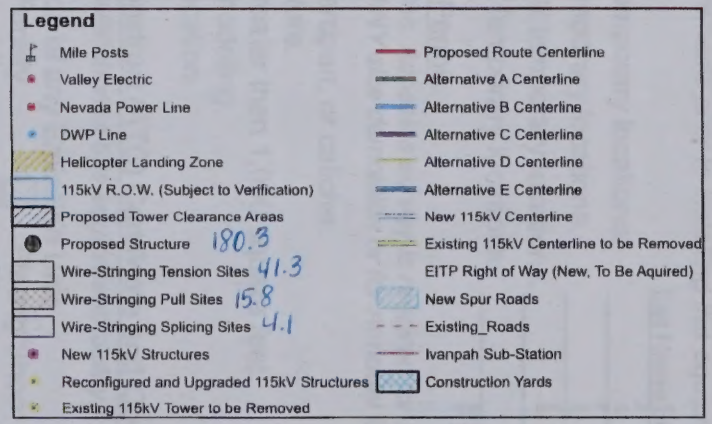
230-kV Transmission Line

	Road Story Legend	Number of areas	Disturbed Area Length (feet)	Disturbed Area Width (feet)	Ground disturbance per area (acres)	Total area disturbed (acres)	Approximate Dates of Activity	Road Story Correlating Page Numbers
INSTALLATION								
Lattice Steel Suspension Structure		178	200	200	0.92	163.45		
Lattice Steel Dead-End Structure		35	200	200	0.92	32.14		
Lattice Steel Heavy Dead-End Structure		3	200	200	0.92	2.75		
Tubular Steel Double H-Frame		21	200	200	0.92	19.28		
TOTAL	Proposed Structure	237				217.63	June 2012 - June 2013	Refer to "Proppsed Alternative", pgs 1-69, 81, 106, 113, 119
NEVADA TOTAL		196				***180.3***		
PULLING								
Stringing Setup - Puller	Wire-Stringing Pull Sites	23	200	150	0.69	15.8	January 2013 - August 2013	1, 2, 3, 5, 14, 19, 20, 23, 34, 46, 49, 51, 53, 58, 62, 63, 69, 81, 94, 106
Stringing Setup - Tensioner	Wire-Stringing Tension Sites	24	500	150	1.72	41.3	February 2012 - April 2012	1, 2, 5, 11, 14, 23, 28, 30, 38, 49, 51, 53, 54, 59, 64, 69, 81, 94, 95, 113, 119
Conductor Splicing Setup	Wire-Stringing Splicing Sites	12	150	100	0.34	4.1	May 2013 - July 2013	37, 62, 65, 66, 106
TOTAL						***61.3***		
230 kV Transmission Line TOTAL						***241.6***		
						250	Rounded up for permit	

ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)

PRELIMINARY DESIGN
SUBJECT TO REVISION

mod 0 = 250.0
estimated acreage to be permitted, accurate acreage & maps will be provided prior to commencing construction activity



NOTE: PRELIMINARY ENGINEERING LOCATIONS SHOWN. R.O.W. BOUNDARY, CONSTRUCTION AREAS, ROADS, ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

THIS DOCUMENT IS CONFIDENTIAL

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Details available in Kodak story (+ permits).
EITP Subtransmission Line
Removal of 115 kV towers
Installation of new 230 kV towers
Access Road work
Staging Areas
EITP Transmission Line

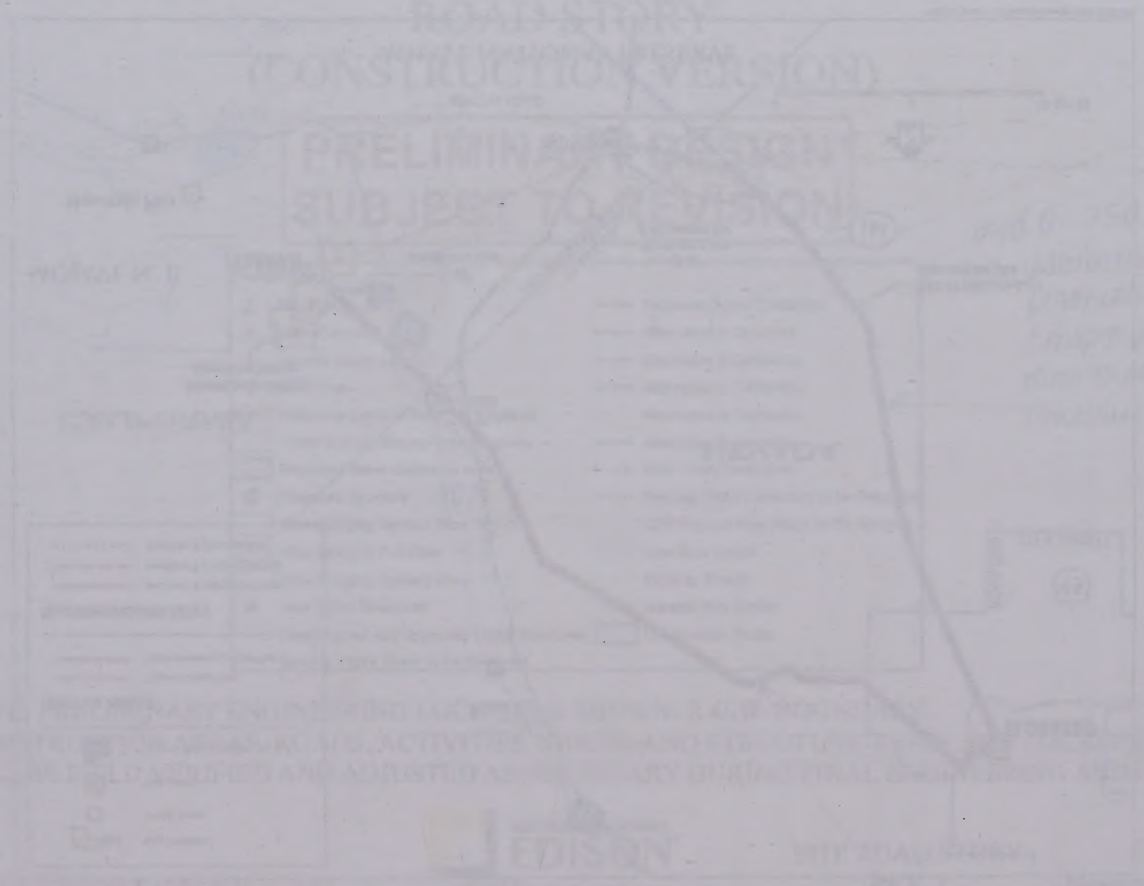
40.367

EITP Underground Fiber Optics

Fiber Optics

EITP Underground Fiber Optics

Figure 2-3 **Proposed Project**


ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)
PRELIMINARY DESIGN
SUBJECT TO REVISION
EDISON

Eldorado-Ivanpah Transmission Project

Dust Control Permit

Staging Areas – Clark County Permit 40364

Air Quality & Environmental Management

500 S. Grand Central Parkway, 1st floor
Las Vegas NV · 89155-1776
(702) 455-5942 · Fax (702) 383-9994

40364-0-1

CLARK COUNTY • LAS VEGAS • NORTH LAS VEGAS • BOULDER CITY • HENDERSON • MESQUITE

DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES INCLUDING SURFACE GRADING AND TRENCHING

THIS PERMIT DOES NOT EXEMPT THE PERMITTEE FROM COMPLIANCE WITH THE ENDANGERED SPECIES ACT

Permit Number: **40364** **Mod: 0**

PAYMENT INFORMATION: 20112542

Fee: **$11,200.00**

Balance Due: $ 0

Permittee and Project Information

Permittee: **Southern California Edison**
Permittee Address: **1218 South Fifth Avenue**
City, State, Zip: **Monrovia CA 91016** Fax No.:: **6264622774**
Project Name: **EITP - Staging Areas**
Project Address: **Highway 95 to Interstate 15**
Located In: *Township:* **25** *Range:* **62** *Section:* **1** EO Area: **SE/SW**
Acreage This Mod: **80** Total Acreage: **80**
Cross Streets: **Highway 95 to Interstate 15**

Project Contact(s)

Normal Hours: **Kirk Riehl**
Company:
Phone: **(714)814-5643**

After Hours: **Arnel "A.L." Wilson**
Company: **Southern California Edison**
Phone: **(626)302-3174**

Issue Date: 12-Sep-2011 **Expiration Date: 12-Sep-2012**

Effective Date: _____

Notes
ATC

- ○ Request Of Sign Waiver
- ○ Public Works Agreement
- ○ Closure Plan
- ○ Conditional Renewal

DUST CONTROL MEASURES MUST OCCUR 24 HOURS A DAY, 7 DAYS A WEEK

THIS PERMIT IS NOT VALID UNTIL ALL FEES ARE PAID IN FULL AND A COMPLETE COPY IS ON THE PROJECT SITE, INCLUDING CONDITIONS OF PERMIT AND DUST MITIGATION PLAN

It is a condition of the issuance of any operating permit required by the commission or pursuant to any local ordinance for the control of air pollution that the holder of the operating permit agrees to permit inspection of the premises to which the permit relates by any authorized officer of the department at any time during the holder's hours of operation without prior notice. This condition must be stated on each application form and operating permit. NRS 445B.580.

The issuance of this PERMIT does not relieve the PERMITTEE from compliance with all other applicable federal, state, county and local ordinances and regulations. Issuance of this PERMIT shall not be a defense to violations of any applicable ordinances or regulations.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

DAQEM Use Only

RECEIVED
CC-DAQM

2011 AUG 25 A 9:01

APPLICATION
DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. **Applicant/Permittee:**

☑ Property Owner ☐ Developer ☐ Prime Contractor ☐ Other _____

Name: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

E-mail Address: Project Manager: roger.~~shultz~~Schultz@sce.com; AQ: arnel.wilson@sce.com

2. **Project:**

Name: EITP - Staging Areas

Address: _____ City: _____

Nearest major cross-streets: Highway 95 to Interstate 15

Township(s): 25 Range(s): 62 Section(s): 1

Assessor's Parcel number(s) (Attach map): 214 00 001 021

Project Description: 6 construction staging areas/helicopter landing pads along route

Project Acreage: 80.0 acres (rounded to the nearest 0.1 acre, all land that will be disturbed must be included in project acreage)

Permit fees: If the project acreage listed above contains a faction, the project acreage will be rounded up to the next whole number for fee purposes. The rounded up acreage (quantity) value will be used to assess the acreage fee for this permitting action.

Submit the total permit fee, with this application. Permit fees are non-refundable.

You must select one of the following three choices.

☐ This project does not require any offsite street or utility development.

☐ This project requires offsite street/utility development that is not included in this application, and will be added at a later date by modification or additional permit.

☑ This application includes offsite street/utility development. (Area must be marked on the accompanying parcel map. Check all that apply)

Utility Lateral ☑ less than 100 ft. ☐ greater than 100 ft. ☑ Half Street ☐ Full Street

☑ Curb / Entrance ☐ Entity Name and Number of Approved Offsite Plan / Permit / Easement: _____ ☐ Plan Pending ☐ Other

3. **Property Owner (if not applicant):**

Name: _____

4. **Point of Contact for dust control matters and to whom a NOTICE OF VIOLATION should be sent if necessary:**

Name: Arnel "A.L." Wilson Company: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

Cellular/Pager: (626) 302-3174 After Hours Phone: (714) 915-1525

5. **On-site Superintendent/Supervisor/Foreman contact:**

Name: Kirk ~~Real~~ Richl Company: _____

On-site phone: (714) 814-5643 Cellular/Pager: (714) 814-5643

DAQEM Dust Class Certification/Card #: DC 0510150 Expiration date: 5·28·13

Have all other on-site supervisory personnel attended the DAQEM Dust Class? ☐ Yes ☒ No

If no, all on-site supervisory personnel must attend a DAQEM Dust Class within 30 days.

7. **By signing this permit application I certify that:**

A. **I am authorized, on behalf of the individual or company listed in Section 1, as Applicant/Permittee, to apply for their Dust Control Permit and to commit to all of the terms and conditions of the requested permit.**

B. **Construction activities will be limited to lands that the applicant/permittee either owns or is authorized to use for construction activities. The permit issued subsequent to this application is not a substitute for obtaining the property owners permission to use his land. Issuance of a Dust Control Permit is intended only for the purpose of controlling emissions of air pollutants and assuring compliance with Air Quality Regulations. The applicant/permittee agrees to hold harmless, indemnify, and defend Clark County, its employees and assigns from any claims that may arise due to any unauthorized use of land for construction activities.**

C. **The permittee accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this permit, comply with the terms and conditions of the permit, the dust mitigation plan and all applicable Air Quality Regulations.**

D. **The applicant/permittee understands that it is a condition of the permit that the permittee agrees to allow the inspection of the site for compliance with the terms and conditions of the permit and Air Quality Regulations at any time during the permittee's hours of operation by a DAQEM officer without prior notice or at any time pursuant to the investigation of a complaint or upon direct observation of emission and/or failure to maintain Best Management Practices.**

E. **I understand that any material misrepresentation made in this application may invalidate the permit and that Clark County may pursue enforcement action against me. In addition, I understand any willful misrepresentation may result in criminal penalties. I declare under penalty of perjury that the foregoing is true and correct.**

Executed on:

August 23, 2011 _____

DATE SIGNATURE

Arnel L. Wilson Air Quality Specialist, SCE

PRINTED NAME TITLE AND COMPANY NAME

Application completed by, if not completed by signatory (Please Print):

_____ Ext. _____
Name Phone Number

PAYMENT INFORMATION **TO BE COMPLETED BY THE APPLICANT**

PAYING BY **(Please Print)**

☐ CASH

☑ CHECK CHECK # 0041194700
NAME AND ADDRESS AS IT APPEARS ON CHECK:
So. Calif. Edison
PO Box 700
Rosemead, CA 91770
Telephone #: _____

☐ CREDIT CARD LAST FOUR DIGITS OF CREDIT CARD NUMBER: _____
EXACT NAME AS IT APPEARS ON CREDIT CARD:
_____

FOR DAQEM USE ONLY

9/12/2011 JS 40364 20112542
ISSUE DATE ISSUED BY POS #

8/25/11 _____
DATE PAID RECEIVED BY

DAQEM REVIEW: _____ DATE: 9.9.11

BLASTING APPROVAL (if applicable): _____ DATE: _____

DEMOLITION APPROVAL (if applicable): _____ DATE: _____

COMPLIANCE AREA ASSIGNMENT: SE & SW Hydrographic Area: 167 Eldorado Valley

☐ Airport ☐ Blasting ☐ Commercial ☐ Demo-Structure ☐ Demo–Other ☐ Staging/Stockpiling
☐ Highway ☐ Schools ☐ Residential ☐ Public Works ☐ Flood Detention ☐ Utilities ☑ Misc.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Arnel L. Wilson
Southern California Edison
1218 South Fifth Avenue
Monrovia, CA 91016
August 23, 2011

Clark County
Department of Air Quality and Environmental Management
500 S. Grand Central Parkway
Las Vegas, NV 89155

Attention: Jennifer Lipkin

RE: Supplement to the Dust Mitigation Plan for EITP – Staging Areas.

This letter is written as a supplement to the Dust Mitigation Plan for the Eldorado-Ivanpah Transmission Project (EITP) – Staging Areas.

Project Description

Staging areas/equipment storage areas will be located in various locations along the transmission line route in Nevada. There will also be two helicopter landing areas to the east and west of McCollough Pass. The six areas are listed below:

Activity	Milepost	Disturbed Area (acres)
Eldorado Substation Yard	0	9.8
Jean Yard	15	13.6
Generating Station Yard	27	16.5
Primm Valley Casino Vacant Lot Yard	28	28.3
East of McCollough Pass Yard (Helicopter Landing Pad 1)	9	5.0
West of McCollough Pass Yard (Helicopter Landing Pad 2)	15	5.7
TOTAL		***78.9***

A total of approximately 80 acres will be utilized for staging areas during construction.

The Eldorado Substation Yard is within an existing substation. The staging area will be fenced off from the rest of the substation.

Expenditure towards dust control for the proposed project is anticipated to be approximately $25 million.

Site Plan

2244 Walnut Grove Ave.
Rosemead, CA 91770

According to the draft construction schedule, staging areas would be utilized throughout the EITP project construction, from as early as October of 2011 through completion of the project in September of 2013.

Please refer to the Eldorado-Ivanpah Transmission Line Road Story for locations and aerial photos.

Additional Explanation of Control Measures

Dust control measures include:

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area.
- Pre-watering of soils prior to clearing and trenching.
- Pre-moistening of, prior to transport, import and export dirt, sand or other loose materials.
- Dedication of water truck or high-capacity hose to any soil screening operations
- Minimization of drop height of material through screening equipment
- Reduction of the amount of disturbed area where possible
- Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan.

Contingency

Contingency measures include the utilization of one 24-hour, on-call person for fugitive dust measure. Upon discovery of any inadequacies, more frequent application procedures will be exercised, and/or dust suppressants will be utilized according to BLM guidelines.

Soil Stabilization Measures

Disturbed soil will be stabilized with the utilization of water applied via water truck periodically throughout the workday. A final application will be applied at the end of the day, with an amount sufficient to maintain a surface crust. Daily records of dust control measures will be maintained.

Employee Dust Control Training and Compliance

The contractor for this portion of the project has not yet been selected. However, once the contractor has been selected, all site supervisors/manager and water truck drivers will be required to complete the DAQEM Dust Control Training and their names and certification numbers will be provided to you. Once the on-site Dust Control Monitor has been selected, form DCP09: Construction Site Dust Control Monitor will be completed and submitted.

Sincerely,

Arnel L. Wilson
Air Quality Specialist

Protecting the air we share

Air Quality

DUST MITIGATION PLAN FOR ALL PROJECTS

Project Name: EITP - Staging Areas

Permittee Name: Southern California Edison

Identify the Project Soil "Particulate Emission Potential" (check all that apply):

Using silt and optimum moisture content to determine the particulate emission potential (PEP) is the preferred method.

☑ PEP determined using generalized PEP determination maps included in the Dust Control Handbook.

☐ PEP determined using silt vs. optimum moisture table in Figure 2 of the Dust Control Handbook.

Percentage of silt through a #200 sieve: ___% Optimum moisture content: ___%

PEP for this project is determined to be:

☑ High ☐ Moderate High ☑ Moderate Low ☐ Low

High in lieu of DC012

Water source: ☐ Hydrant with Jones Valve ☐ Fire hose ☑ Water trucks/pulls ☐ Well
☑ Stand tanks ☐ Ponds ☐ Other:_____

PROJECT ACTIVITIES CHECKLIST

Instructions:

Place a check mark in the box to the right of each Project Activity that will occur on your project. If additional soil disturbing activities that are not on the checklist are to be included in the project, list them on a separate page and provide a description. For a more complete description of the listed activities, see the Control Measures Selection Pages (Form DCP03) that follow or refer to the Best Management Practices for dust control in the Dust Control Handbook.

BMP 10 Disturbed Soil and BMP 20 Trackout Prevention and Cleanup must be marked for every Dust Mitigation Plan.

CONTROL MEASURES SELECTION PAGES

Instructions:

For each project activity that you have selected on the Project Activities Checklist you must include the corresponding Control Measures Selection Page. Read and understand each item listed as a "Requirement" on these included pages. Where control measure options are listed, place a check in the box in front of the control measure you will use to meet that requirement. You must select at least one control measure where a choice is listed. In addition you must select the control measure that corresponds to your PEP as listed above, if applicable.

NOTE: PROJECTS 10 ACRES AND LARGER MUST COMPLETE A SUPPLEMENT TO THE DUST MITIGARTION PLAN (APPENDIX B-1 AND B-2).

Protecting the air we share

Air Quality

PROJECT ACTIVITIES CHECKLIST

Project Name: EITP - Staging Areas

Permittee Name: Southern California Edison

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY COMPLETE THE CORRESPONDING CONTROL MEASURES SELECTION PAGE AND INCLUDE WITH APPLICATION.

BMP	Project Activity	Check All That Apply
01	Backfilling Filling area previously excavated or trenched.	☐
02	Blasting - Abrasive Sandblasting and/or abrasive blasting.	☐
03	Blasting Soil & Rock Explosive blasting of soil and rock.	☐
04	Clearing & Grubbing Clearing and grubbing for site preparation and vacant land cleanup.	☑
05	Clearing Forms, Foundations and Slabs Clearing and cleaning of forms, foundations and slabs prior to pouring concrete.	☑
06	Crushing Crushing of construction and demolition debris, rock and soil.	☐
07	Cut and/or Fill Cut and/or fill soils for site grade preparation.	☐
08	Demolition - Implosion Implosive demolition of a structure, using explosives.	☐
09	Demolition - Mechanical/Manual Mechanical and manual demolition of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls and/or removal of transit pipe	☐
10	Disturbed Soil **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Disturbed soil throughout project including between structures.	☑
11	Disturbed Land - Long Term Stabilization Large tracts of disturbed land that will not have continuing activity for more than 30 days.	☑
12	Dust Suppressants - Selection and Use Selection and use of chemical and organic dust suppressing agents and other dust palliatives.	☐
13	Importing/Exporting Materials Importing or exporting of soil, aggregate, decorative rock, debris, Type II and other bulk material.	☑
14	Landscaping Installation of sod, decorative rock, desert or other landscape material.	☐
15	Paving/Subgrade Preparation Subgrade preparation for paving streets, parking lots, etc.	☐
16	Sawing/Cutting Material Sawing or cutting materials such as concrete, asphalt, block or pipe.	☐
17	Screening Screening of rock, soil or construction debris.	☐
18	Staging Areas Staging areas, equipment storage, vehicle parking lots, and material storage areas.	☑
19	Stockpiles Stockpiling of materials, such as Type II, other soils, rock or debris, for future use or export.	☐
20	Trackout Prevention and Cleanup **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Prevention and cleanup of mud, silt and soil tracked out onto paved roads.	☑
21	Traffic - Unpaved Routes and Parking Construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.	☑
22	Trenching Trenching with track or wheel mounted excavator, shovel, backhoe or trencher.	☐
23	Truck Loading Loading trucks with materials including construction and demolition debris, rock and soil.	☑

EITP - Staging Areas

CLEARING AND GRUBBING — BMP 04

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 04-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 04-2 Apply and maintain a dust palliative on surface soils where support equipment and vehicles will operate.

Requirement: Stabilize soil during clearing and grubbing activities.

- ☑ 04-3 **L & ML:** Apply water during clearing and grubbing activities.
- ☐ 04-4 **MH:** Apply water and tackifier mixture during clearing and grubbing activities.
- ☑ 04-5 **H:** Apply water and surfactant mixture during clearing and grubbing activities.

Requirement: Stabilize disturbed soil immediately after clearing and grubbing activities.

- ☑ 04-6 Water disturbed soils to form crust immediately following clearing and grubbing activities.
- ☐ 04-7 Apply and maintain a dust palliative on disturbed soils to form crust immediately following clearing and grubbing activities.

Recommendations: Maintain live perennial vegetation and desert pavement where possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Staging Areas

CLEARING FORMS, FOUNDATIONS AND SLABS — BMP 05

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible emissions to no more than an average of 20% opacity for any period aggregating 3 minutes in any 60-minute period pursuant to Air Quality Regulations.

- ☑ 05-1 Use single stage pours, unless prohibited by engineering design or building code, to minimize clearing.

Note: At least one of the following must be selected.

- ☑ 05-2 Use water spray to clear forms, foundations and slabs.
- ☐ 05-3 Use sweeping and water spray to clear forms, foundations and slabs.
- ☐ 05-4 Use industrial vacuum to clear forms, foundations and slabs prior to the use of high pressure air to blow soil and debris.
- ☐ 05-5 Use industrial vacuum to clear forms, foundations and slabs.

Recommendations: Verify Building Code Restrictions for use of water on slabs.

Avoid use of high pressure air to blow soil and debris from forms, foundations and slabs.

EITP - Staging Areas

DISTURBED SOIL — BMP 10

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.

Requirement: Limit vehicle traffic and disturbance of soils where possible.

- ☑ 10-1 Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

Requirement: Stabilize and maintain stability of all disturbed soil throughout construction site.

Note: You must choose one or more of the following.

- ☑ 10-2 Apply water to stabilize disturbed soils. Soils must be kept in a sufficiently damp, crusted or covered condition.
- ☐ 10-3 Apply and maintain a dust palliative based on soil type and future plans.

Requirement: Soil conditions, including preventive and corrective measures, must be recorded every day the construction project is active.

- ☑ 10-4 Record soil conditions and dust control actions in daily project records.

Recommendations: If interior block walls are planned, install as early in the construction as possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Staging Areas

DISTURBED LAND – Long-Term Stabilization — BMP 11

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize soil to meet standards required by Air Quality Regulation Section 90.

- ☑ 11-1 Apply and maintain a dust palliative on disturbed soils for long-term stabilization. contingency
- ☐ 11-2 Stabilize disturbed soil with vegetation for long-term stabilization.
- ☐ 11-3 Pave or apply surface rock for long-term stabilization.
- ☐ 11-4 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☑ 11-5 Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization.

Requirement: Prevent access to limit soil disturbance.

- ☑ 11-6 Prevent access by fencing, ditches, vegetation, berms or other suitable barrier or means approved by the Control Officer.

Recommendations: Plant perimeter vegetation early. Use of native and drought-tolerant plants with greater than 50 % silhouette area is encouraged.

See also: BMP 12: DUST SUPPRESSANT, DUST PALLIATIVE AND SURFACTANT – Selection and Use.

EITP - Staging Areas

IMPORTING/EXPORTING SOIL, ROCK AND OTHER BULK MATERIAL — BMP 13

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 13-1 Apply water and limit vehicle speeds to 15 mph on the work site.
- ☐ 13-2 Apply and maintain dust suppressant on haul routes.

Requirement: Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage.

Requirement: Maintain 3-6 inches of freeboard to minimize spillage.

Requirement: Stabilize materials during transport on site.

- ☐ 13-3 Use tarps or other suitable enclosures on haul trucks.
- ☑ 13-4 Stabilize materials with water.

Requirement: Clean wheels and undercarriage of haul trucks prior to leaving construction site.

Recommendations: Verify State and local laws, concerning the hauling of bulk materials on public roadways.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP.
BMP 23: TRUCK LOADING.

EITP - Staging Areas

STAGING AREAS — BMP 18

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 18-1 Limit vehicle speeds to 15 mph in the staging area and on all unpaved access routes.
- ☐ 18-2 Apply and maintain dust suppressant on all vehicle traffic areas in the staging areas and unpaved access routes.

Requirement: Stabilize staging area soils during use.

- ☑ 18-3 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 18-4 Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.

Requirement: Stabilize staging area soils at project completion.

- ☐ 18-5 Apply a dust palliative.
- ☑ 18-6 Apply screened or washed Type II aggregate.
- ☐ 18-7 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☐ 18-8 Pave with thin paving.
- ☐ 18-9 Completed project will cover staging area with buildings, paving, and/or landscaping.
- ☐ 18-10 Apply water to form adequate crust and prevent access.

Recommendations: Limit size of staging areas.

Limit ingress and egress points.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP

EITP - Staging Areas

TRACKOUT PREVENTION AND CLEANUP — BMP 20

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: In soils that have a PEP classification of "High", pave construction activities roadways as early as possible.

Requirement: Use of soil to create a ramp for vehicle access over a curb is prohibited.

Requirement: Trackout conditions, including preventive and corrective measures, must be recorded daily for every day that the construction project access is used by vehicles.

☑ 20-1 Record soil conditions and dust control actions in daily project records.

Requirement: Prevent dust from trackout.

☐ 20-2 Immediately clean trackout from paved surfaces to maintain dust control. Trackout must not extend 50 feet or more.

☑ 20-3 Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. Trackout must not extend 50 feet or more and must be cleaned daily, at minimum.

Requirement: Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or travel routes intersect.

☐ 20-4 Install gravel pad(s) consisting of 1" to 3" rough diameter, clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.

☐ 20-5 Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.

☐ 20-6 Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.

☑ 20-7 Install wheel shakers in the event that trackout cannot be controlled with gravel pads.

☐ 20-8 Install wheel washer in the event that trackout cannot be controlled with gravel pads and wheel shakers.

☐ 20-9 Motorized vehicles will only operate on paved surfaces.

(Continued on next page)

Requirement: All exiting traffic must be routed over selected trackout control device(s).

- [x] 20-10 Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).
- [ ] 20-11 Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.

EITP - Staging Areas

TRAFFIC – Unpaved Routes and Parking Areas — BMP 21

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 21-1 Limit vehicle speeds to 15 mph on all unpaved routes and parking areas.
- ☐ 21-2 Apply and maintain dust palliative on all vehicle travel areas.

Requirement: Stabilize all haul routes.

- ☑ 21-3 Apply water to haul routes and maintain in a stabilized condition.
- ☐ 21-4 Apply a dust palliative to haul routes and maintain in a stabilized condition.
- ☐ 21-5 Apply gravel to haul routes and maintain in a stabilized condition.
- ☐ 21-6 Supplement dust palliative or aggregate applications with watering, if necessary.

Requirement: Stabilize all off-road and parking areas.

- ☑ 21-7 Apply water to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-8 Apply gravel to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-9 Apply recycled asphalt (or other suitable material) to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-10 Apply and maintain a dust palliative (designed for vehicle traffic) to off-road traffic and parking areas and maintain in a stabilized condition.

Recommendations: Use of bumps or dips for speed control is encouraged.

Apply paving as soon as possible to all future roadway areas for PEP categories other than "High".

EITP - Staging Areas

TRUCK LOADING — BMP 23

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Ensure all loads are covered prior to leaving the construction site and traveling on public roadways.

Requirement: Stabilize surface soils where loaders, support equipment and vehicles will operate.

- ☑ 23-1 Pre-water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate.
- ☐ 23-2 Apply and maintain a dust palliative on surface soils where loaders, support equipment and vehicles will operate.

Requirement: Stabilize material during loading.

- ☑ 23-3 Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping.

Note: You must selected 23-3 if PEP is greater than LOW, in addition one of the following must be selected.

- ☐ 23-4 **L & ML:** Mix material with water prior to loading.
- ☑ 23-5 **L & ML:** Spray material with water while loading.
- ☐ 23-6 **MH:** Mix material with a water and tackifier mixture prior to loading.
- ☐ 23-7 **MH:** Spray material with a water and tackifier mixture while loading.
- ☐ 23-8 **H:** Mix material with a water and surfactant mixture prior to loading.
- ☑ 23-9 **H:** Spray material with a water and surfactant mixture while loading.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

CONSTRUCTION ACTIVITIES DUST CONTROL PERMIT SUPPLEMENTAL PERMITS/APPROVALS CHECKLIST

The following construction activities require permits or approval in addition to a Dust Control Permit. Permits or approvals must be obtained prior to conducting the activity. This form must be submitted with every Dust Mitigation Plan. *Check all activities that apply to the construction project.*

Activities requiring a Portable Source Permit:
(Comply with Portable Source requirements prior to installing this equipment on the project site.)

Operation of a: List Name of Company and/or Permit #

- ☐ powered crusher at temporary locations. _____
- ☐ powered screen at temporary locations. _____
- ☐ concrete batch plant at temporary locations. _____
- ☐ asphalt batch plant at temporary locations. _____

Activities requiring Supplemental Permit:
(Submit applicable supplemental forms. Asbestos survey is required for any size demo/remodel. NESHAP notification is required for ANY size demolition or for remodel if RACM is found.)

- ☐ Blasting to fracture rock, hardpan, or caliche.
- ☐ Blasting to implode a structure.
- ☐ Demolition of a structure greater than 1,000 square feet.
  - ☐ Structural remodeling
  - ☐ Structure relocation

Activities requiring Authority to Construct (ATC) Certificate and Operating Permit:
(An ATC must be obtained prior to installation of this equipment/facility.)

- ☐ Construction of or installation of any Emission Unit
  - ☐ Gasoline Dispensing Facility
  - ☐ Cooling Tower
  - ☐ Dry Cleaning Equipment
  - ☐ Plating Shop
  - ☐ Incinerator
  - ☐ Boiler
  - ☑ Emergency Standby Generator or Other Internal Combustion Engine
  - ☐ Woodworking Process Equipment
  - ☑ Power Generation Facility or Equipment
  - ☐ Crushing or Screening Stationary Source
  - ☐ Concrete or Asphalt Plant Stationary Source
  - ☐ Commercial Surface Coating Equipment including Paint Spray Booth
  - ☐ Other Source of PM_{10}, CO, VOC, NO_x, SO_2, Lead, Hazardous Air Pollutant, or Toxic Chemical Substance

- ☐ Activities Listed Above Do Not Apply to this Construction Project:

Staging Areas

Activity	Milepost	Disturbed Area (acres)
Eldorado Substation Yard	0	9.8
Jean Yard	15	13.6
Generating Station Yard	27	16.5
Primm Valley Casino Vacant Lot Yard	28	28.3
East of McCollough Pass Yard (Helicopter Landing Pad 1)	9	5.0
West of McCollough Pass Yard (Helicopter Landing Pad 2)	15	5.7
TOTAL		***78.9***

Notes:
Staging area acreage from Table 2, page 14 of Draft Eldorado-Ivanpah Transmission Line Project Right-of-Way Plan of Development (POD), May 2011.
Does not include Yard areas in California.
Does not include Whiskey Pete's Yard, which is no longer part of the project.
78.9 acres rounded up to 80 acres to permit

mod 0 = 80.0 (estimated acreage to be permitted, accurate acreage and maps will be provided prior to commencing construction activity)

Jennifer Lipkin

From: Arnel.Wilson@sce.com
Sent: Thursday, August 25, 2011 5:44 PM
To: Jennifer Lipkin
Cc: Tammy.Chavez@sce.com
Subject: Map Locations of SCE EITP Staging Areas

Jennifer,

The locations of the planned staging areas are presented in the "Road Story" legend as "Construction Yards".

The following table lists yards and map pages from the Road Story file.

Staging Area	Milepost	Map Page
✓ Eldorado Substation Yard	0	1
Jean Yard	15	Not available
Generating Station Yard	27	107
Primm Valley Casino Vacant Lot Yard	28	56
East of McCollough Pass Yard (Helicopter Landing Pad 1)	9	17
West of McCollough Pass Yard (Helicopter Landing Pad 2)	15	28, 29

These locations are subject to change since we have not secured the leases for the land. The only one that we're certain will not change is the Eldorado substation yard within the fence line of the existing facility.

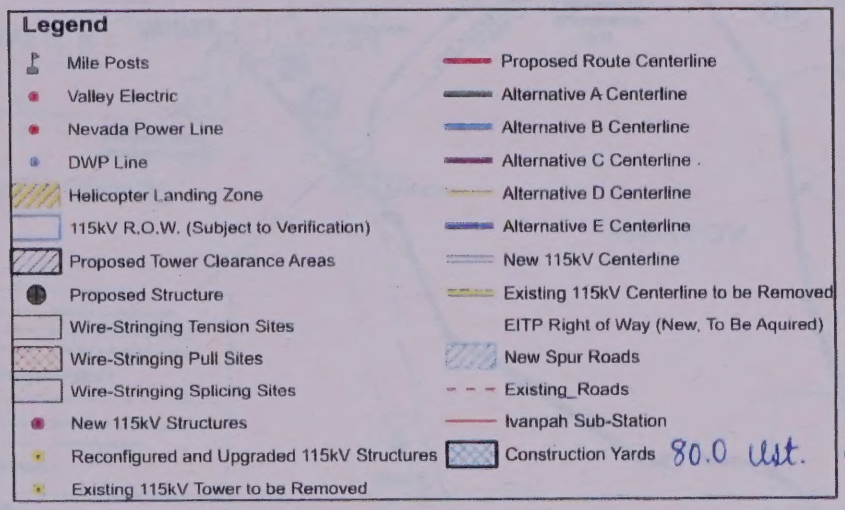
If you concur, we will provide you an updated location map for each staging area at least two weeks prior to any construction.

Please let me know if you need any additional information.

Arnel "A.L." Wilson
CEH&S Air Quality Compliance
626-862-6857 SCE cell
714-915-1525 personal cell

ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)

PRELIMINARY DESIGN
SUBJECT TO REVISION



electronic copy of Road Story available

NOTE: PRELIMINARY ENGINEERING LOCATIONS SHOWN. R.O.W. BOUNDARY, CONSTRUCTION AREAS, ROADS, ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

THIS DOCUMENT IS CONFIDENTIAL

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

40364

Details available in Road Study (4 permits)
EITP Subtransmission Line
Removal of 115 kV towers
Installation of new 230 kV towers
Access Road work
Staging Areas
EITP Transmission Line

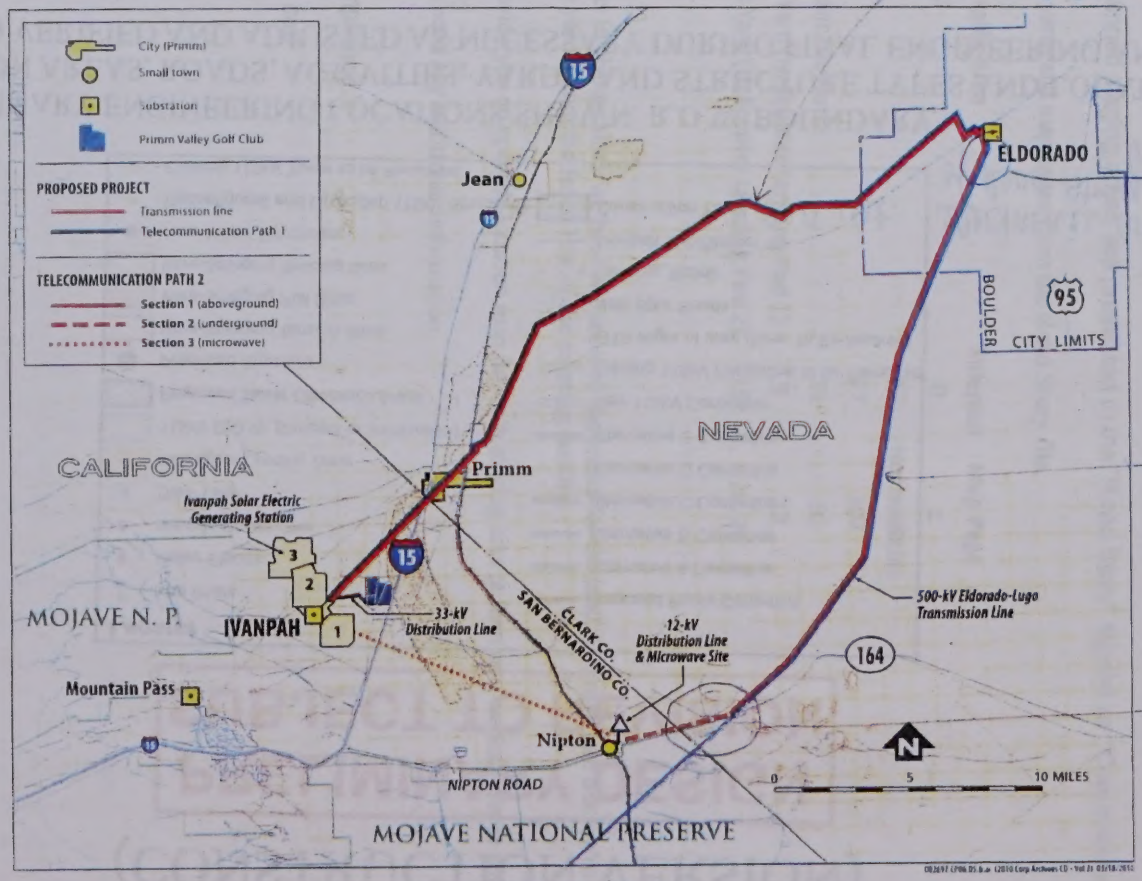


Figure 2-3 **Proposed Project**

Eldorado-Nuevo Transmission Project

Dust Control Permit

Access Roads – Clark County Permit
#00353

Eldorado-Ivanpah Transmission Project

Dust Control Permit

Access Roads – Clark County Permit 40363

Air Quality & Environmental Management

500 S. Grand Central Parkway, 1st floor
Las Vegas NV · 89155-1776
(702) 455-5942 · Fax (702) 383-9994

40363-0-1

CLARK COUNTY • LAS VEGAS • NORTH LAS VEGAS • BOULDER CITY • HENDERSON • MESQUITE

DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES INCLUDING SURFACE GRADING AND TRENCHING

THIS PERMIT DOES NOT EXEMPT THE PERMITTEE FROM COMPLIANCE WITH THE ENDANGERED SPECIES ACT

Permit Number: **40363** **Mod: 0**

PAYMENT INFORMATION: 20112339

Fee: **$2,100.00**

Balance Due: $ 0

Permittee and Project Information

Permittee:	**Southern California Edison**
Permittee Address:	**1218 South Fifth Avenue**
City, State, Zip:	**Monrovia CA 91016**
Fax No.::	**6264622774**
Project Name:	**EITP - Access Roads**
Project Address:	**Highway 95 to Interstate 15**
Located In:	*Township:* **25** *Range:* **62** *Section:* **1** EO Area: **SE/SW**
Acreage This Mod:	**15** Total Acreage: **15**
Cross Streets:	**Highway 95 to Interstate 15**

Project Contact(s)

Normal Hours:	**Kirk Riehl**	After Hours:	**Arnel "A.L." Wilson**
Company:		Company:	**Southern California Edison**
Phone:	**(714)814-5643**	Phone:	**(626)302-3174**

Issue Date: **12-Sep-2011** **Expiration Date:** **12-Sep-2012**

Effective Date:_____

Notes

ATC

- ○ Request Of Sign Waiver
- ○ Public Works Agreement
- ○ Closure Plan
- ○ Conditional Renewal

DUST CONTROL MEASURES MUST OCCUR 24 HOURS A DAY, 7 DAYS A WEEK

THIS PERMIT IS NOT VALID UNTIL ALL FEES ARE PAID IN FULL AND A COMPLETE COPY IS ON THE PROJECT SITE, INCLUDING CONDITIONS OF PERMIT AND DUST MITIGATION PLAN

It is a condition of the issuance of any operating permit required by the commission or pursuant to any local ordinance for the control of air pollution that the holder of the operating permit agrees to permit inspection of the premises to which the permit relates by any authorized officer of the department at any time during the holder's hours of operation without prior notice. This condition must be stated on each application form and operating permit. NRS 445B.580.

The issuance of this PERMIT does not relieve the PERMITTEE from compliance with all other applicable federal, state, county and local ordinances and regulations. Issuance of this PERMIT shall not be a defense to violations of any applicable ordinances or regulations.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

DAQEM Use Only

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CC-DAQM

2011 AUG 25 A 8:55

APPLICATION
DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. **Applicant/Permittee:**

☑ Property Owner ☐ Developer ☐ Prime Contractor ☐ Other _____

Name: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

E-mail Address: Project Manager: roger.~~shultz~~Schultz@sce.com; AQ: arnel.wilson@sce.com

2. **Project:**

Name: EITP - Access Roads

Address: _____ City: _____

Nearest major cross-streets: Highway 95 to Interstate 15

Township(s): 25 Range(s): 62 Section(s): 1

Assessor's Parcel number(s) (Attach map): 214 00 001 021

Project Description: New access/spur roads, and improvements to some existing roads

Project Acreage: 15.0 acres (rounded to the nearest 0.1 acre, all land that will be disturbed must be included in project acreage)

Permit fees: If the project acreage listed above contains a faction, the project acreage will be rounded up to the next whole number for fee purposes. The rounded up acreage (quantity) value will be used to assess the acreage fee for this permitting action.

Submit the total permit fee, with this application. Permit fees are non-refundable.

You must select one of the following three choices.

☐ This project does not require any offsite street or utility development.

☐ This project requires offsite street/utility development that is not included in this application, and will be added at a later date by modification or additional permit.

☑ This application includes offsite street/utility development. (Area must be marked on the accompanying parcel map. Check all that apply)

Utility Lateral ☑ less than 100 ft. ☐ greater than 100 ft. ☑ Half Street ☐ Full Street

☑ Curb / Entrance ☐ Entity Name and Number of Approved Offsite Plan / Permit / Easement: _____ ☐ Plan Pending ☐ Other

3. **Property Owner (if not applicant):**

Name: _____

4. **Point of Contact for dust control matters and to whom a NOTICE OF VIOLATION should be sent if necessary:**

Name: Arnel "A.L." Wilson Company: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: ____ Fax: (626) 462-2774

Cellular/Pager: (626) 302-3174 After Hours Phone: (714) 915-1525

5. **On-site Superintendent/Supervisor/Foreman contact:**

Name: Kirk ~~Reat~~ Richl Company: ____

On-site phone: (714) 814-5643 Cellular/Pager: (714) 814-5643

DAQEM Dust Class Certification/Card #: DC 0510150 Expiration date: 5·28·13

Have all other on-site supervisory personnel attended the DAQEM Dust Class? ☐ Yes ☒ No

If no, all on-site supervisory personnel must attend a DAQEM Dust Class within 30 days.

7. **By signing this permit application I certify that:**

A. **I am authorized, on behalf of the individual or company listed in Section 1, as Applicant/Permittee, to apply for their Dust Control Permit and to commit to all of the terms and conditions of the requested permit.**

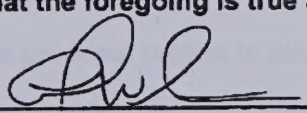
B. **Construction activities will be limited to lands that the applicant/permittee either owns or is authorized to use for construction activities. The permit issued subsequent to this application is not a substitute for obtaining the property owners permission to use his land. Issuance of a Dust Control Permit is intended only for the purpose of controlling emissions of air pollutants and assuring compliance with Air Quality Regulations. The applicant/permittee agrees to hold harmless, indemnify, and defend Clark County, its employees and assigns from any claims that may arise due to any unauthorized use of land for construction activities.**

C. **The permittee accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this permit, comply with the terms and conditions of the permit, the dust mitigation plan and all applicable Air Quality Regulations.**

D. **The applicant/permittee understands that it is a condition of the permit that the permittee agrees to allow the inspection of the site for compliance with the terms and conditions of the permit and Air Quality Regulations at any time during the permittee's hours of operation by a DAQEM officer without prior notice or at any time pursuant to the investigation of a complaint or upon direct observation of emission and/or failure to maintain Best Management Practices.**

E. **I understand that any material misrepresentation made in this application may invalidate the permit and that Clark County may pursue enforcement action against me. In addition, I understand any willful misrepresentation may result in criminal penalties. I declare under penalty of perjury that the foregoing is true and correct.**

Executed on:

August 23, 2011 

DATE SIGNATURE

Arnel L. Wilson Air Quality Specialist, SCE

PRINTED NAME TITLE AND COMPANY NAME

Application completed by, if not completed by signatory (Please Print):

_____ Ext._____
Name Phone Number

PAYMENT INFORMATION **TO BE COMPLETED BY THE APPLICANT**

PAYING BY **(Please Print)**

☐ CASH

☑ CHECK CHECK # 0041194701
NAME AND ADDRESS AS IT APPEARS ON CHECK:
So. Calif. Edison
PO Box 300
Rosemead, Ca 91770
Telephone #: _____

☐ CREDIT CARD LAST FOUR DIGITS OF CREDIT CARD NUMBER: _____
EXACT NAME AS IT APPEARS ON CREDIT CARD:
_____

FOR DAQEM USE ONLY

9/12/2011 ISSUED BY 20S 40363 POS # 20112539
ISSUE DATE

8/25/11 DATE PAID RECEIVED BY

DAQEM REVIEW: _____ DATE: 9.9.11

BLASTING APPROVAL (if applicable): _____ DATE: _____

DEMOLITION APPROVAL (if applicable): _____ DATE: _____

COMPLIANCE AREA ASSIGNMENT: SE & SW Hydrographic Area: 167-Eldorado Valley

☐ Airport ☐ Blasting ☐ Commercial ☐ Demo-Structure ☐ Demo-Other ☐ Staging/Stockpiling
☐ Highway ☐ Schools ☐ Residential ☐ Public Works ☐ Flood Detention ☐ Utilities ☑ Misc.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Arnel L. Wilson
Southern California Edison
1218 South Fifth Avenue
Monrovia, CA 91016
August 23, 2011

Clark County
Department of Air Quality and Environmental Management
500 S. Grand Central Parkway
Las Vegas, NV 89155

Attention: Jennifer Lipkin

RE: Supplement to the Dust Mitigation Plan for Eldorado-Ivanpah Transmission Project.

This letter is written as a supplement to the Dust Mitigation Plan for the Eldorado-Ivanpah Transmission Project (EITP) – Access Roads.

Project Description

A main access road along the transmission line would be used to haul construction materials overland to the project sites. The road system proposed includes spur roads to individual towers where the access road would need to deviate from the transmission line due to topographic restraints. In general, access and spur roads are dirt roads that are at least 14 feet wide (assumed 15 feet wide in disturbance area calculations). Access roads follow the transmission right-of-way. Spur roads branch from access roads toward the transmission structures and would be an average of 200 feet long.

Existing access roads would be used to construct the project, but some might require improvements or upgrades to allow passage of construction vehicles. Approximately 29 miles of existing access roads are within the Nevada side of the project. We are estimating 10% of the existing access roads will need improvements or upgrades. Additionally, 1.2 miles of new access roads and 1.7 miles of new permanent spur roads would be constructed in Nevada.

A total of approximately 15 acres will be disturbed for road improvements and construction.

Expenditure towards dust control for the proposed project is anticipated to be approximately $25 million.

Site Plan

According to the draft construction schedule, access road improvements and new access road and spur road construction would take place between February 2012 and April 2013.

2244 Walnut Grove Ave.
Rosemead, CA 91770

Please refer to the Eldorado-Ivanpah Transmission Line Road Story for locations and aerial photos.

Additional Explanation of Control Measures

Dust control measures include:

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area.
- Pre-watering of soils prior to clearing and trenching.
- Pre-moistening of, prior to transport, import and export dirt, sand or other loose materials.
- Dedication of water truck or high-capacity hose to any soil screening operations
- Minimization of drop height of material through screening equipment
- Reduction of the amount of disturbed area where possible
- Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan.

Contingency

Contingency measures include the utilization of one 24-hour, on-call person for fugitive dust measure. Upon discovery of any inadequacies, more frequent application procedures will be exercised, and/or dust suppressants will be utilized according to BLM guidelines.

Soil Stabilization Measures

Disturbed soil will be stabilized with the utilization of water applied via water truck periodically throughout the workday. A final application will be applied at the end of the day, with an amount sufficient to maintain a surface crust. Daily records of dust control measures will be maintained.

Employee Dust Control Training and Compliance

The contractor for this portion of the project has not yet been selected. However, once the contractor has been selected, all site supervisors/manager and water truck drivers will be required to complete the DAQEM Dust Control Training and their names and certification numbers will be provided to you. Once the on-site Dust Control Monitor has been selected, form DCP09: Construction Site Dust Control Monitor will be completed and submitted.

Sincerely,

Arnel L. Wilson
Air Quality Specialist

Protecting the air we share

Air Quality

DUST MITIGATION PLAN FOR ALL PROJECTS

Project Name: EITP - Access Roads

Permittee Name: Southern California Edison

Identify the Project Soil "Particulate Emission Potential" (check all that apply):

Using silt and optimum moisture content to determine the particulate emission potential (PEP) is the preferred method.

☑ PEP determined using generalized PEP determination maps included in the Dust Control Handbook.

☐ PEP determined using silt vs. optimum moisture table in Figure 2 of the Dust Control Handbook.

Percentage of silt through a #200 sieve: ___% Optimum moisture content: ___%

PEP for this project is determined to be:

☑ High ☐ Moderate High ☑ Moderate Low ☐ Low

High in lieu of DCP12

Water source: ☐ Hydrant with Jones Valve ☐ Fire hose ☑ Water trucks/pulls ☐ Well ☑ Stand tanks ☐ Ponds ☐ Other:_____

PROJECT ACTIVITIES CHECKLIST

Instructions:

Place a check mark in the box to the right of each Project Activity that will occur on your project. If additional soil disturbing activities that are not on the checklist are to be included in the project, list them on a separate page and provide a description. For a more complete description of the listed activities, see the Control Measures Selection Pages (Form DCP03) that follow or refer to the Best Management Practices for dust control in the Dust Control Handbook.

BMP 10 Disturbed Soil and BMP 20 Trackout Prevention and Cleanup must be marked for every Dust Mitigation Plan.

CONTROL MEASURES SELECTION PAGES

Instructions:

For each project activity that you have selected on the Project Activities Checklist you must include the corresponding Control Measures Selection Page. Read and understand each item listed as a "Requirement" on these included pages. Where control measure options are listed, place a check in the box in front of the control measure you will use to meet that requirement. You must select at least one control measure where a choice is listed. In addition you must select the control measure that corresponds to your PEP as listed above, if applicable.

NOTE: PROJECTS 10 ACRES AND LARGER MUST COMPLETE A SUPPLEMENT TO THE DUST MITIGARTION PLAN (APPENDIX B-1 AND B-2).

Protecting the air we share

Air Quality

PROJECT ACTIVITIES CHECKLIST

Project Name: EITP - Access Roads

Permittee Name: Southern California Edison

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY COMPLETE THE CORRESPONDING CONTROL MEASURES SELECTION PAGE AND INCLUDE WITH APPLICATION.

BMP	Project Activity	Check All That Apply
01	Backfilling Filling area previously excavated or trenched.	☐
02	Blasting - Abrasive Sandblasting and/or abrasive blasting.	☐
03	Blasting Soil & Rock Explosive blasting of soil and rock.	☐
04	Clearing & Grubbing Clearing and grubbing for site preparation and vacant land cleanup.	☑
05	Clearing Forms, Foundations and Slabs Clearing and cleaning of forms, foundations and slabs prior to pouring concrete.	☐
06	Crushing Crushing of construction and demolition debris, rock and soil.	☐
07	Cut and/or Fill Cut and/or fill soils for site grade preparation.	☐
08	Demolition - Implosion Implosive demolition of a structure, using explosives.	☐
09	Demolition - Mechanical/Manual Mechanical and manual demolition of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls and/or removal of transit pipe	☐
10	Disturbed Soil **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Disturbed soil throughout project including between structures.	☑
11	Disturbed Land - Long Term Stabilization Large tracts of disturbed land that will not have continuing activity for more than 30 days.	☑
12	Dust Suppressants - Selection and Use Selection and use of chemical and organic dust suppressing agents and other dust palliatives.	☐
13	Importing/Exporting Materials Importing or exporting of soil, aggregate, decorative rock, debris, Type II and other bulk material.	☐
14	Landscaping Installation of sod, decorative rock, desert or other landscape material.	☐
15	Paving/Subgrade Preparation Subgrade preparation for paving streets, parking lots, etc.	☐
16	Sawing/Cutting Material Sawing or cutting materials such as concrete, asphalt, block or pipe.	☐
17	Screening Screening of rock, soil or construction debris.	☐
18	Staging Areas Staging areas, equipment storage, vehicle parking lots, and material storage areas.	☐
19	Stockpiles Stockpiling of materials, such as Type II, other soils, rock or debris, for future use or export.	☐
20	Trackout Prevention and Cleanup **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Prevention and cleanup of mud, silt and soil tracked out onto paved roads.	☑
21	Traffic - Unpaved Routes and Parking Construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.	☑
22	Trenching Trenching with track or wheel mounted excavator, shovel, backhoe or trencher.	☐
23	Truck Loading Loading trucks with materials including construction and demolition debris, rock and soil.	☑

EITP - Access Roads

CLEARING AND GRUBBING — BMP 04

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 04-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 04-2 Apply and maintain a dust palliative on surface soils where support equipment and vehicles will operate.

Requirement: Stabilize soil during clearing and grubbing activities.

- ☑ 04-3 **L & ML:** Apply water during clearing and grubbing activities.
- ☐ 04-4 **MH:** Apply water and tackifier mixture during clearing and grubbing activities.
- ☑ 04-5 **H:** Apply water and surfactant mixture during clearing and grubbing activities.

Requirement: Stabilize disturbed soil immediately after clearing and grubbing activities.

- ☑ 04-6 Water disturbed soils to form crust immediately following clearing and grubbing activities.
- ☐ 04-7 Apply and maintain a dust palliative on disturbed soils to form crust immediately following clearing and grubbing activities.

Recommendations: Maintain live perennial vegetation and desert pavement where possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Access Roads

DISTURBED SOIL — BMP 10

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.

Requirement: Limit vehicle traffic and disturbance of soils where possible.

☑ 10-1 Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

Requirement: Stabilize and maintain stability of all disturbed soil throughout construction site.

Note: You must choose one or more of the following.

☑ 10-2 Apply water to stabilize disturbed soils. Soils must be kept in a sufficiently damp, crusted or covered condition.

☐ 10-3 Apply and maintain a dust palliative based on soil type and future plans.

Requirement: Soil conditions, including preventive and corrective measures, must be recorded every day the construction project is active.

☑ 10-4 Record soil conditions and dust control actions in daily project records.

Recommendations: If interior block walls are planned, install as early in the construction as possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Access Roads

DISTURBED LAND – Long-Term Stabilization — BMP 11

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize soil to meet standards required by Air Quality Regulation Section 90.

- ☑ 11-1 Apply and maintain a dust palliative on disturbed soils for long-term stabilization. Contingency
- ☐ 11-2 Stabilize disturbed soil with vegetation for long-term stabilization.
- ☐ 11-3 Pave or apply surface rock for long-term stabilization.
- ☐ 11-4 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☑ 11-5 Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization.

Requirement: Prevent access to limit soil disturbance.

- ☑ 11-6 Prevent access by fencing, ditches, vegetation, berms or other suitable barrier or means approved by the Control Officer.

Recommendations: Plant perimeter vegetation early. Use of native and drought-tolerant plants with greater than 50 % silhouette area is encouraged.

See also: BMP 12: DUST SUPPRESSANT, DUST PALLIATIVE AND SURFACTANT – Selection and Use.

EITP - Access Roads

TRACKOUT PREVENTION AND CLEANUP — BMP 20

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: In soils that have a PEP classification of "High", pave construction activities roadways as early as possible.

Requirement: Use of soil to create a ramp for vehicle access over a curb is prohibited.

Requirement: Trackout conditions, including preventive and corrective measures, must be recorded daily for every day that the construction project access is used by vehicles.

☑ 20-1 Record soil conditions and dust control actions in daily project records.

Requirement: Prevent dust from trackout.

☐ 20-2 Immediately clean trackout from paved surfaces to maintain dust control. Trackout must not extend 50 feet or more.

☑ 20-3 Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. Trackout must not extend 50 feet or more and must be cleaned daily, at minimum.

Requirement: Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or travel routes intersect.

☐ 20-4 Install gravel pad(s) consisting of 1" to 3" rough diameter, clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.

☐ 20-5 Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.

☐ 20-6 Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.

☑ 20-7 Install wheel shakers in the event that trackout cannot be controlled with gravel pads.

☐ 20-8 Install wheel washer in the event that trackout cannot be controlled with gravel pads and wheel shakers.

☐ 20-9 Motorized vehicles will only operate on paved surfaces.

(Continued on next page)

Requirement: All exiting traffic must be routed over selected trackout control device(s).

- [x] 20-10 Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).
- [ ] 20-11 Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.

EITP - Access Roads

TRAFFIC – Unpaved Routes and Parking Areas — BMP 21

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 21-1 Limit vehicle speeds to 15 mph on all unpaved routes and parking areas.
- ☐ 21-2 Apply and maintain dust palliative on all vehicle travel areas.

Requirement: Stabilize all haul routes.

- ☑ 21-3 Apply water to haul routes and maintain in a stabilized condition.
- ☐ 21-4 Apply a dust palliative to haul routes and maintain in a stabilized condition.
- ☐ 21-5 Apply gravel to haul routes and maintain in a stabilized condition.
- ☐ 21-6 Supplement dust palliative or aggregate applications with watering, if necessary.

Requirement: Stabilize all off-road and parking areas.

- ☑ 21-7 Apply water to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-8 Apply gravel to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-9 Apply recycled asphalt (or other suitable material) to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-10 Apply and maintain a dust palliative (designed for vehicle traffic) to off-road traffic and parking areas and maintain in a stabilized condition.

Recommendations: Use of bumps or dips for speed control is encouraged.

Apply paving as soon as possible to all future roadway areas for PEP categories other than "High".

EITP - Access Roads

TRUCK LOADING

BMP 23

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Ensure all loads are covered prior to leaving the construction site and traveling on public roadways.

Requirement: Stabilize surface soils where loaders, support equipment and vehicles will operate.

- ☑ 23-1 Pre-water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate.
- ☐ 23-2 Apply and maintain a dust palliative on surface soils where loaders, support equipment and vehicles will operate.

Requirement: Stabilize material during loading.

- ☑ 23-3 Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping.

Note: You must selected 23-3 if PEP is greater than LOW, in addition one of the following must be selected.

- ☐ 23-4 **L & ML:** Mix material with water prior to loading.
- ☑ 23-5 **L & ML:** Spray material with water while loading.
- ☐ 23-6 **MH:** Mix material with a water and tackifier mixture prior to loading.
- ☐ 23-7 **MH:** Spray material with a water and tackifier mixture while loading.
- ☐ 23-8 **H:** Mix material with a water and surfactant mixture prior to loading.
- ☑ 23-9 **H:** Spray material with a water and surfactant mixture while loading.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

CONSTRUCTION ACTIVITIES DUST CONTROL PERMIT SUPPLEMENTAL PERMITS/APPROVALS CHECKLIST

The following construction activities require permits or approval in addition to a Dust Control Permit. Permits or approvals must be obtained prior to conducting the activity. This form must be submitted with every Dust Mitigation Plan. *Check all activities that apply to the construction project.*

Activities requiring a Portable Source Permit:
(Comply with Portable Source requirements prior to installing this equipment on the project site.)

Operation of a: List Name of Company and/or Permit #

- ☐ powered crusher at temporary locations. _____
- ☐ powered screen at temporary locations. _____
- ☐ concrete batch plant at temporary locations. _____
- ☐ asphalt batch plant at temporary locations. _____

Activities requiring Supplemental Permit:
(Submit applicable supplemental forms. Asbestos survey is required for any size demo/remodel. NESHAP notification is required for ANY size demolition or for remodel if RACM is found.)

- ☐ Blasting to fracture rock, hardpan, or caliche.
- ☐ Blasting to implode a structure.
- ☐ Demolition of a structure greater than 1,000 square feet.
  - ☐ Structural remodeling
  - ☐ Structure relocation

Activities requiring Authority to Construct (ATC) Certificate and Operating Permit:
(An ATC must be obtained prior to installation of this equipment/facility.)

- ☐ Construction of or installation of any Emission Unit
  - ☐ Gasoline Dispensing Facility
  - ☐ Cooling Tower
  - ☐ Dry Cleaning Equipment
  - ☐ Plating Shop
  - ☐ Incinerator
  - ☐ Boiler
  - ☑ Emergency Standby Generator or Other Internal Combustion Engine
  - ☐ Woodworking Process Equipment
  - ☑ Power Generation Facility or Equipment
  - ☐ Crushing or Screening Stationary Source
  - ☐ Concrete or Asphalt Plant Stationary Source
  - ☐ Commercial Surface Coating Equipment including Paint Spray Booth
  - ☐ Other Source of PM_{10}, CO, VOC, NO_x, SO_2, Lead, Hazardous Air Pollutant, or Toxic Chemical Substance

- ☐ Activities Listed Above Do Not Apply to this Construction Project:

Access Roads

	Road Story Legend	Length (miles)	Length (yards)	Width (yards)	TOTAL (square yards)	TOTAL (acres)	Approximate Dates of Activity
Existing Access Road Improvements	Existing_Roads (10% of total)	2.9	5104	5	25520	**5.27**	February 2012 - April 2013
New Access Roads	★	1.2	2112	5	10560	**2.18**	
New Spur Roads	New Spur Roads	1.7	2992	5	14960	**3.09**	
						10.55	Rounded up to 15 acres to permit

Notes:

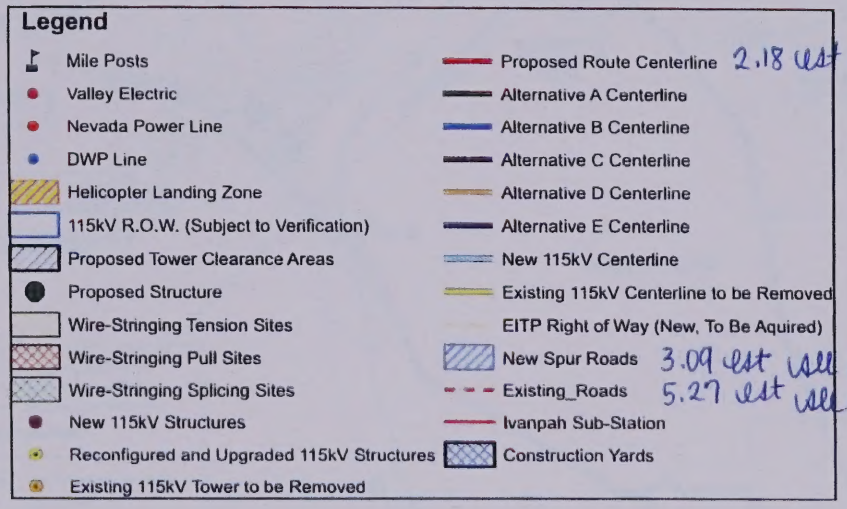
★ Map locations of New Spur Roads for the permitted Proposed Project (not including Alternatives A-E) can be found within the *EITP Road Story* , November 2009 on pages: 2, 3, 12, 14-23, 25, 26, 32-36, 49, 51, 58, 69, and 81

Proposed Project Legend: Proposed Route Centerline

mod 0 = 15.0 (estimated acreage to be permitted, accurate acreage and maps will be provided prior to commencing construction activity.)

ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY available in electronic form
(CONSTRUCTION VERSION)

PRELIMINARY DESIGN
SUBJECT TO REVISION



2.18 est see details

3.09 est see details

5.27 est see details

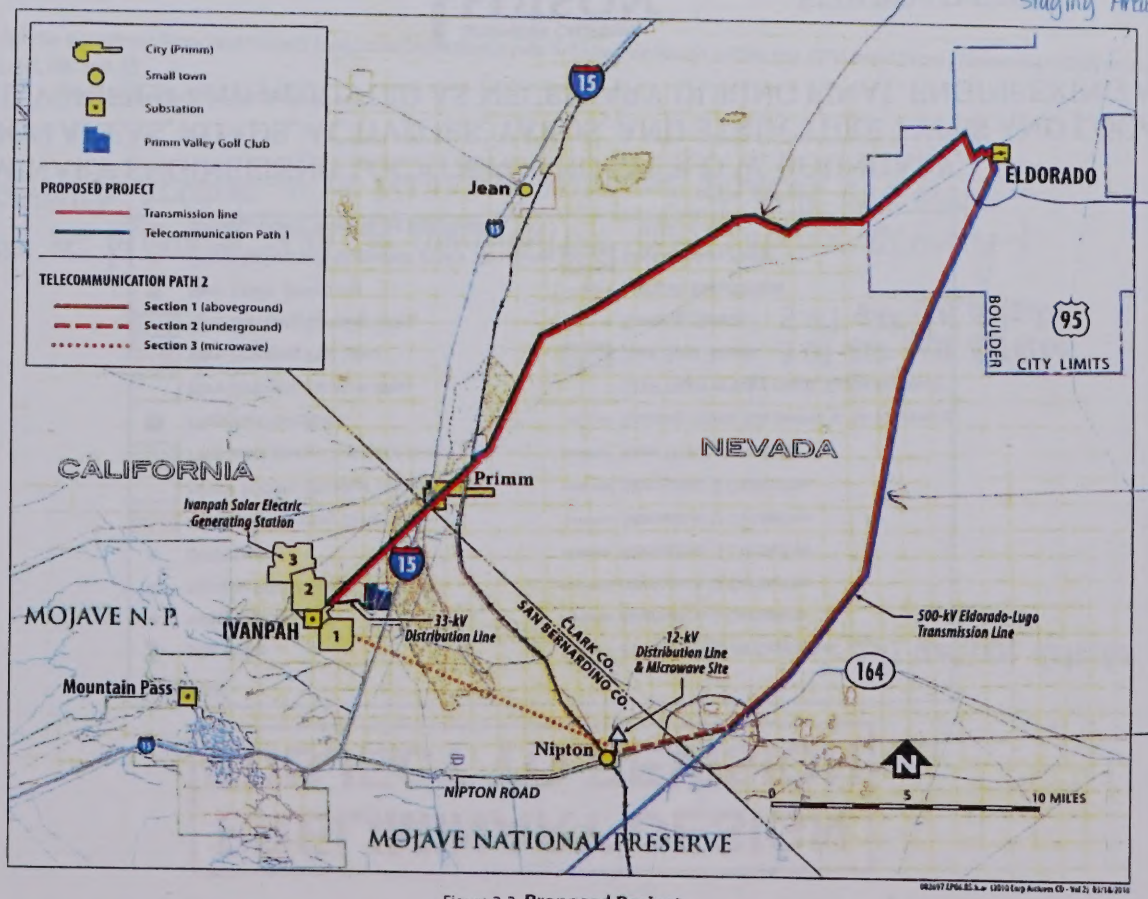
NOTE: PRELIMINARY ENGINEERING LOCATIONS SHOWN. R.O.W. BOUNDARY, CONSTRUCTION AREAS, ROADS, ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

THIS DOCUMENT IS CONFIDENTIAL

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

40363

Details available in Road Study Comments.
EITP Subtransmission Line
Removal of 115 kV towers
Installation of new 230 kV towers
Access Road work
Staging Areas
EITP Transmission Line



EITP Underground Fiber Optics

Fiber Optic Staging

EITP Underground Fiber Optics

Figure 2-3 **Proposed Project**

Eldorado-Numpa® Transmission Project

Dust Control Permit
Fiber Optic Stringing – Clark County
Permit #03295

Eldorado-Ivanpah Transmission Project

Dust Control Permit

Fiber Optic Stringing – Clark County

Permit 40395

Air Quality & Environmental Management

500 S. Grand Central Parkway, 1st floor
Las Vegas NV · 89155-1776
(702) 455-5942 · Fax (702) 383-9994

40395-0-1

CLARK COUNTY • LAS VEGAS • NORTH LAS VEGAS • BOULDER CITY • HENDERSON • MESQUITE

DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES INCLUDING SURFACE GRADING AND TRENCHING

THIS PERMIT DOES NOT EXEMPT THE PERMITTEE FROM COMPLIANCE WITH THE ENDANGERED SPECIES ACT

Permit Number:

40395 **Mod: 0**

PAYMENT INFORMATION: 20112541

Fee: **$4,200.00**

Balance Due: $ 0

Permittee and Project Information

Permittee: **Southern California Edison**
Permittee Address: **1218 South Fifth Avenue**
City, State, Zip: **Monrovia NV 91016** Fax No.:: **6264622774**
Project Name: **EITP - Fiber Optic Stringing**
Project Address: **Highway 95 to Interstate 15**
Located In: *Township:* **25** *Range:* **62** *Section:* **1** EO Area: **SE/SW**
Acreage This Mod: **30** Total Acreage: **30**
Cross Streets: **Highway 95 to Interstate 15**

Project Contact(s)

Normal Hours: **Kirk Riehl**
Company:
Phone: **(714)814-5643**

After Hours: **Arnel "A.L." Wilson**
Company: **Southern California Edison**
Phone: **(626)302-3174**

Issue Date: **21-Sep-2011** **Expiration Date:** **21-Sep-2012**

Effective Date:_____

Notes
ATC

- ○ Request Of Sign Waiver
- ○ Public Works Agreement
- ○ Closure Plan
- ○ Conditional Renewal

DUST CONTROL MEASURES MUST OCCUR 24 HOURS A DAY, 7 DAYS A WEEK

THIS PERMIT IS NOT VALID UNTIL ALL FEES ARE PAID IN FULL AND A COMPLETE COPY IS ON THE PROJECT SITE, INCLUDING CONDITIONS OF PERMIT AND DUST MITIGATION PLAN

It is a condition of the issuance of any operating permit required by the commission or pursuant to any local ordinance for the control of air pollution that the holder of the operating permit agrees to permit inspection of the premises to which the permit relates by any authorized officer of the department at any time during the holder's hours of operation without prior notice. This condition must be stated on each application form and operating permit. NRS 445B.580.

The issuance of this PERMIT does not relieve the PERMITTEE from compliance with all other applicable federal, state, county and local ordinances and regulations. Issuance of this PERMIT shall not be a defense to violations of any applicable ordinances or regulations.

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2011 AUG 25 A 8:57

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

APPLICATION
DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. **Applicant/Permittee:**

☑ Property Owner ☐ Developer ☐ Prime Contractor ☐ Other _____

Name: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

E-mail Address: Project Manager: roger.~~shultz~~Schultz@sce.com; AQ: arnel.wilson@sce.com

2. **Project:**

Name: EITP - Fiber Optic Stringing

Address: _____ City: _____

Nearest major cross-streets: Highway 95 to Interstate 15

Township(s): 25 Range(s): 62 Section(s): 1

Assessor's Parcel number(s) (Attach map): 214 00 001 021

Project Description: Pulling and stringing sites for the fiber optic line above-ground install

Project Acreage: 30.0 acres (rounded to the nearest 0.1 acre, all land that will be disturbed must be included in project acreage)

Permit fees: If the project acreage listed above contains a faction, the project acreage will be rounded up to the next whole number for fee purposes. The rounded up acreage (quantity) value will be used to assess the acreage fee for this permitting action.

Submit the total permit fee, with this application. Permit fees are non-refundable.

You must select one of the following three choices.

☐ This project does not require any offsite street or utility development.

☐ This project requires offsite street/utility development that is not included in this application, and will be added at a later date by modification or additional permit.

☑ This application includes offsite street/utility development. (Area must be marked on the accompanying parcel map. Check all that apply)

Utility Lateral ☑ less than 100 ft. ☐ greater than 100 ft. ☑ Half Street ☐ Full Street

☑ Curb / Entrance ☐ Entity Name and Number of Approved Offsite Plan / Permit / Easement: _____ ☐ Plan Pending ☐ Other

3. **Property Owner (if not applicant):**

Name: _____

4. **Point of Contact for dust control matters and to whom a NOTICE OF VIOLATION should be sent if necessary:**

Name: Arnel "A.L." Wilson Company: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: ____ Fax: (626) 462-2774

Cellular/Pager: (626) 302-3174 After Hours Phone: (714) 915-1525

5. **On-site Superintendent/Supervisor/Foreman contact:**

Name: Kirk ~~Real~~ Riehl Company: ____

On-site phone: (714) 814-5643 Cellular/Pager: (714) 814-5643

DAQEM Dust Class Certification/Card #: DC 0510150 Expiration date: 5-28-13

Have all other on-site supervisory personnel attended the DAQEM Dust Class? ☐ Yes ☒ No

If no, all on-site supervisory personnel must attend a DAQEM Dust Class within 30 days.

7. **By signing this permit application I certify that:**

A. **I am authorized, on behalf of the individual or company listed in Section 1, as Applicant/Permittee, to apply for their Dust Control Permit and to commit to all of the terms and conditions of the requested permit.**

B. **Construction activities will be limited to lands that the applicant/permittee either owns or is authorized to use for construction activities. The permit issued subsequent to this application is not a substitute for obtaining the property owners permission to use his land. Issuance of a Dust Control Permit is intended only for the purpose of controlling emissions of air pollutants and assuring compliance with Air Quality Regulations. The applicant/permittee agrees to hold harmless, indemnify, and defend Clark County, its employees and assigns from any claims that may arise due to any unauthorized use of land for construction activities.**

C. **The permittee accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this permit, comply with the terms and conditions of the permit, the dust mitigation plan and all applicable Air Quality Regulations.**

D. **The applicant/permittee understands that it is a condition of the permit that the permittee agrees to allow the inspection of the site for compliance with the terms and conditions of the permit and Air Quality Regulations at any time during the permittee's hours of operation by a DAQEM officer without prior notice or at any time pursuant to the investigation of a complaint or upon direct observation of emission and/or failure to maintain Best Management Practices.**

E. **I understand that any material misrepresentation made in this application may invalidate the permit and that Clark County may pursue enforcement action against me. In addition, I understand any willful misrepresentation may result in criminal penalties. I declare under penalty of perjury that the foregoing is true and correct.**

Executed on:

August 23, 2011 _____

DATE SIGNATURE

Arnel L. Wilson Air Quality Specialist, SCE

PRINTED NAME TITLE AND COMPANY NAME

Application completed by, if not completed by signatory (Please Print):

_____ Ext._____
Name Phone Number

PAYMENT INFORMATION **TO BE COMPLETED BY THE APPLICANT**

PAYING BY **(Please Print)**

☐ CASH

☑ CHECK CHECK # 0041194702
NAME AND ADDRESS AS IT APPEARS ON CHECK:
So. Calif. Edison
P O Box 700
Rosemead, Ca 91770
Telephone #: _____

☐ CREDIT CARD LAST FOUR DIGITS OF CREDIT CARD NUMBER: _____
EXACT NAME AS IT APPEARS ON CREDIT CARD:
_____

FOR DAQEM USE ONLY

9/21/2011 ISSUE DATE | 20S 40395 ISSUED BY | 20112541 POS #

8/25/11 DATE PAID | MK RECEIVED BY

DAQEM REVIEW: _____ DATE: 9-20-11

BLASTING APPROVAL (if applicable): _____ DATE: _____

DEMOLITION APPROVAL (if applicable): _____ DATE: _____

COMPLIANCE AREA ASSIGNMENT: SE & SW Hydrographic Area: 167 Eldorado Valley

☐ Airport ☐ Blasting ☐ Commercial ☐ Demo-Structure ☐ Demo--Other ☐ Staging/Stockpiling
☐ Highway ☐ Schools ☐ Residential ☐ Public Works ☐ Flood Detention ☐ Utilities ☑ Misc.

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Arnel L. Wilson
Southern California Edison
1218 South Fifth Avenue
Monrovia, CA 91016
August 23, 2011

Clark County
Department of Air Quality and Environmental Management
500 S. Grand Central Parkway
Las Vegas, NV 89155

Attention: Jennifer Lipkin

RE: Supplement to the Dust Mitigation Plan for EITP – Fiber Optic Stringing.

This letter is written as a supplement to the Dust Mitigation Plan for the Eldorado-Ivanpah Transmission Project (EITP) – Fiber Optic Stringing.

Project Description

The telecommunication system would consist of two fully diverse and redundant telecommunication paths, and would include replacement of an overhead groundwire, with a new optical groundwire, on an approximate 25-mile section of the existing SCE Eldorado-Lugo 500-kV transmission line, and installation of approximately 5 miles of fiber optic cable in an underground duct from the Eldorado-Lugo transmission line to the Town of Nipton in California. Approximately 2 of the 5 miles of fiber optic cable are within Nevada.

A total of approximately 30 acres will be disturbed to retrofit existing lattice steel structures, and optical ground wire stringing/pulling. Please note, an additional 5 acres is covered under the EITP – Fiber Optic Underground Permit Application.

Expenditure towards dust control for the proposed project is anticipated to be approximately $25 million.

Site Plan

According to the draft construction schedule, tower retrofits and fiber optic stringing would take place between February 2012 and October 2012.

Please refer to the Eldorado-Ivanpah Transmission Line Road Story for locations and aerial photos.

Additional Explanation of Control Measures

Dust control measures include:

2244 Walnut Grove Ave.
Rosemead, CA 91770

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area.
- Pre-watering of soils prior to clearing and trenching.
- Pre-moistening of, prior to transport, import and export dirt, sand or other loose materials.
- Dedication of water truck or high-capacity hose to any soil screening operations
- Minimization of drop height of material through screening equipment
- Reduction of the amount of disturbed area where possible
- Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan.

Contingency

Contingency measures include the utilization of one 24-hour, on-call person for fugitive dust measure. Upon discovery of any inadequacies, more frequent application procedures will be exercised, and/or dust suppressants will be utilized according to BLM guidelines.

Soil Stabilization Measures

Disturbed soil will be stabilized with the utilization of water applied via water truck periodically throughout the workday. A final application will be applied at the end of the day, with an amount sufficient to maintain a surface crust. Daily records of dust control measures will be maintained.

Employee Dust Control Training and Compliance

The contractor for this portion of the project has not yet been selected. However, once the contractor has been selected, all site supervisors/manager and water truck drivers will be required to complete the DAQEM Dust Control Training and their names and certification numbers will be provided to you. Once the on-site Dust Control Monitor has been selected, form DCP09: Construction Site Dust Control Monitor will be completed and submitted.

Sincerely,

Arnel L. Wilson
Air Quality Specialist

Protecting the air we share

Air Quality

DUST MITIGATION PLAN FOR ALL PROJECTS

Project Name: EITP - Fiber Optic Stringing

Permittee Name: Southern California Edison

Identify the Project Soil "Particulate Emission Potential" (check all that apply):

Using silt and optimum moisture content to determine the particulate emission potential (PEP) is the preferred method.

☑ PEP determined using generalized PEP determination maps included in the Dust Control Handbook.

☐ PEP determined using silt vs. optimum moisture table in Figure 2 of the Dust Control Handbook.

Percentage of silt through a #200 sieve: ___% Optimum moisture content: ___%

PEP for this project is determined to be:

☑ High ☐ Moderate High ☑ Moderate Low ☐ Low

In lieu of soil sample

Water source: ☐ Hydrant with Jones Valve ☐ Fire hose ☑ Water trucks/pulls ☐ Well
☑ Stand tanks ☐ Ponds ☐ Other:_____

PROJECT ACTIVITIES CHECKLIST

Instructions:

Place a check mark in the box to the right of each Project Activity that will occur on your project. If additional soil disturbing activities that are not on the checklist are to be included in the project, list them on a separate page and provide a description. For a more complete description of the listed activities, see the Control Measures Selection Pages (Form DCP03) that follow or refer to the Best Management Practices for dust control in the Dust Control Handbook.

BMP 10 Disturbed Soil and BMP 20 Trackout Prevention and Cleanup must be marked for every Dust Mitigation Plan.

CONTROL MEASURES SELECTION PAGES

Instructions:

For each project activity that you have selected on the Project Activities Checklist you must include the corresponding Control Measures Selection Page. Read and understand each item listed as a "Requirement" on these included pages. Where control measure options are listed, place a check in the box in front of the control measure you will use to meet that requirement. You must select at least one control measure where a choice is listed. In addition you must select the control measure that corresponds to your PEP as listed above, if applicable.

NOTE: PROJECTS 10 ACRES AND LARGER MUST COMPLETE A SUPPLEMENT TO THE DUST MITIGARTION PLAN (APPENDIX B-1 AND B-2).

Protecting the air we share

Air Quality

PROJECT ACTIVITIES CHECKLIST

Project Name: EITP - Fiber Optic Stringing

Permittee Name: Southern California Edison

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY COMPLETE THE CORRESPONDING CONTROL MEASURES SELECTION PAGE AND INCLUDE WITH APPLICATION.

BMP	Project Activity	Check All That Apply
01	Backfilling Filling area previously excavated or trenched.	☐
02	Blasting - Abrasive Sandblasting and/or abrasive blasting.	☐
03	Blasting Soil & Rock Explosive blasting of soil and rock.	☐
04	Clearing & Grubbing Clearing and grubbing for site preparation and vacant land cleanup.	☑
05	Clearing Forms, Foundations and Slabs Clearing and cleaning of forms, foundations and slabs prior to pouring concrete.	☐
06	Crushing Crushing of construction and demolition debris, rock and soil.	☐
07	Cut and/or Fill Cut and/or fill soils for site grade preparation.	☐
08	Demolition - Implosion Implosive demolition of a structure, using explosives.	☐
09	Demolition - Mechanical/Manual Mechanical and manual demolition of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls and/or removal of transit pipe	☐
10	Disturbed Soil **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Disturbed soil throughout project including between structures.	☑
11	Disturbed Land - Long Term Stabilization Large tracts of disturbed land that will not have continuing activity for more than 30 days.	☑
12	Dust Suppressants - Selection and Use Selection and use of chemical and organic dust suppressing agents and other dust palliatives.	☐
13	Importing/Exporting Materials Importing or exporting of soil, aggregate, decorative rock, debris, Type II and other bulk material.	☑
14	Landscaping Installation of sod, decorative rock, desert or other landscape material.	☐
15	Paving/Subgrade Preparation Subgrade preparation for paving streets, parking lots, etc.	☐
16	Sawing/Cutting Material Sawing or cutting materials such as concrete, asphalt, block or pipe.	☐
17	Screening Screening of rock, soil or construction debris.	☐
18	Staging Areas Staging areas, equipment storage, vehicle parking lots, and material storage areas.	☑
19	Stockpiles Stockpiling of materials, such as Type II, other soils, rock or debris, for future use or export.	☐
20	Trackout Prevention and Cleanup **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Prevention and cleanup of mud, silt and soil tracked out onto paved roads.	☑
21	Traffic - Unpaved Routes and Parking Construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.	☑
22	Trenching Trenching with track or wheel mounted excavator, shovel, backhoe or trencher.	☐
23	Truck Loading Loading trucks with materials including construction and demolition debris, rock and soil.	☑

EITP - Fiber Optic Stringing

CLEARING AND GRUBBING — BMP 04

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 04-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 04-2 Apply and maintain a dust palliative on surface soils where support equipment and vehicles will operate.

Requirement: Stabilize soil during clearing and grubbing activities.

- ☑ 04-3 **L & ML:** Apply water during clearing and grubbing activities.
- ☐ 04-4 **MH:** Apply water and tackifier mixture during clearing and grubbing activities.
- ☑ 04-5 **H:** Apply water and surfactant mixture during clearing and grubbing activities.

Requirement: Stabilize disturbed soil immediately after clearing and grubbing activities.

- ☑ 04-6 Water disturbed soils to form crust immediately following clearing and grubbing activities.
- ☐ 04-7 Apply and maintain a dust palliative on disturbed soils to form crust immediately following clearing and grubbing activities.

Recommendations: Maintain live perennial vegetation and desert pavement where possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Fiber Optic Stringing

DISTURBED SOIL — BMP 10

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.

Requirement: Limit vehicle traffic and disturbance of soils where possible.

☑ 10-1 Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

Requirement: Stabilize and maintain stability of all disturbed soil throughout construction site.

Note: You must choose one or more of the following.

☑ 10-2 Apply water to stabilize disturbed soils. Soils must be kept in a sufficiently damp, crusted or covered condition.

☐ 10-3 Apply and maintain a dust palliative based on soil type and future plans.

Requirement: Soil conditions, including preventive and corrective measures, must be recorded every day the construction project is active.

☑ 10-4 Record soil conditions and dust control actions in daily project records.

Recommendations: If interior block walls are planned, install as early in the construction as possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Fiber Optic Stringing

DISTURBED LAND – Long-Term Stabilization — BMP 11

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize soil to meet standards required by Air Quality Regulation Section 90.

- ☑ 11-1 Apply and maintain a dust palliative on disturbed soils for long-term stabilization. contingency
- ☐ 11-2 Stabilize disturbed soil with vegetation for long-term stabilization.
- ☐ 11-3 Pave or apply surface rock for long-term stabilization.
- ☐ 11-4 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☑ 11-5 Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization.

Requirement: Prevent access to limit soil disturbance.

- ☑ 11-6 Prevent access by fencing, ditches, vegetation, berms or other suitable barrier or means approved by the Control Officer.

Recommendations: Plant perimeter vegetation early. Use of native and drought-tolerant plants with greater than 50 % silhouette area is encouraged.

See also: BMP 12: DUST SUPPRESSANT, DUST PALLIATIVE AND SURFACTANT – Selection and Use.

EITP - Fiber Optic Stringing

IMPORTING/EXPORTING SOIL, ROCK AND OTHER BULK MATERIAL — BMP 13

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 13-1 Apply water and limit vehicle speeds to 15 mph on the work site.
- ☐ 13-2 Apply and maintain dust suppressant on haul routes.

Requirement: Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage.

Requirement: Maintain 3-6 inches of freeboard to minimize spillage.

Requirement: Stabilize materials during transport on site.

- ☐ 13-3 Use tarps or other suitable enclosures on haul trucks.
- ☑ 13-4 Stabilize materials with water.

Requirement: Clean wheels and undercarriage of haul trucks prior to leaving construction site.

Recommendations: Verify State and local laws, concerning the hauling of bulk materials on public roadways.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP.
BMP 23: TRUCK LOADING.

EITP - Fiber Optic Stringing

STAGING AREAS — BMP 18

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 18-1 Limit vehicle speeds to 15 mph in the staging area and on all unpaved access routes.
- ☐ 18-2 Apply and maintain dust suppressant on all vehicle traffic areas in the staging areas and unpaved access routes.

Requirement: Stabilize staging area soils during use.

- ☑ 18-3 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 18-4 Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.

Requirement: Stabilize staging area soils at project completion.

- ☐ 18-5 Apply a dust palliative.
- ☑ 18-6 Apply screened or washed Type II aggregate.
- ☐ 18-7 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☐ 18-8 Pave with thin paving.
- ☐ 18-9 Completed project will cover staging area with buildings, paving, and/or landscaping.
- ☐ 18-10 Apply water to form adequate crust and prevent access.

Recommendations: Limit size of staging areas.

Limit ingress and egress points.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP

EITP - Fiber Optic Stringing

TRACKOUT PREVENTION AND CLEANUP — BMP 20

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: In soils that have a PEP classification of "High", pave construction activities roadways as early as possible.

Requirement: Use of soil to create a ramp for vehicle access over a curb is prohibited.

Requirement: Trackout conditions, including preventive and corrective measures, must be recorded daily for every day that the construction project access is used by vehicles.

☑ 20-1 Record soil conditions and dust control actions in daily project records.

Requirement: Prevent dust from trackout.

☐ 20-2 Immediately clean trackout from paved surfaces to maintain dust control. Trackout must not extend 50 feet or more.

☑ 20-3 Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. Trackout must not extend 50 feet or more and must be cleaned daily, at minimum.

Requirement: Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or travel routes intersect.

☐ 20-4 Install gravel pad(s) consisting of 1" to 3" rough diameter, clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.

☐ 20-5 Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.

☐ 20-6 Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.

☑ 20-7 Install wheel shakers in the event that trackout cannot be controlled with gravel pads.

☐ 20-8 Install wheel washer in the event that trackout cannot be controlled with gravel pads and wheel shakers.

☐ 20-9 Motorized vehicles will only operate on paved surfaces.

(Continued on next page)

Requirement: All exiting traffic must be routed over selected trackout control device(s).

☑ 20-10 Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).

☐ 20-11 Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.

EITP - Fiber Optic Stringing

TRAFFIC – Unpaved Routes and Parking Areas — BMP 21

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 21-1 Limit vehicle speeds to 15 mph on all unpaved routes and parking areas.
- ☐ 21-2 Apply and maintain dust palliative on all vehicle travel areas.

Requirement: Stabilize all haul routes.

- ☑ 21-3 Apply water to haul routes and maintain in a stabilized condition.
- ☐ 21-4 Apply a dust palliative to haul routes and maintain in a stabilized condition.
- ☐ 21-5 Apply gravel to haul routes and maintain in a stabilized condition.
- ☐ 21-6 Supplement dust palliative or aggregate applications with watering, if necessary.

Requirement: Stabilize all off-road and parking areas.

- ☑ 21-7 Apply water to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-8 Apply gravel to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-9 Apply recycled asphalt (or other suitable material) to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-10 Apply and maintain a dust palliative (designed for vehicle traffic) to off-road traffic and parking areas and maintain in a stabilized condition.

Recommendations: Use of bumps or dips for speed control is encouraged.

Apply paving as soon as possible to all future roadway areas for PEP categories other than "High".

EITP - Fiber Optic Stringing

TRUCK LOADING — BMP 23

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Ensure all loads are covered prior to leaving the construction site and traveling on public roadways.

Requirement: Stabilize surface soils where loaders, support equipment and vehicles will operate.

- ☑ 23-1 Pre-water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate.
- ☐ 23-2 Apply and maintain a dust palliative on surface soils where loaders, support equipment and vehicles will operate.

Requirement: Stabilize material during loading.

- ☑ 23-3 Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping.

Note: You must selected 23-3 if PEP is greater than LOW, in addition one of the following must be selected.

- ☐ 23-4 **L & ML:** Mix material with water prior to loading.
- ☑ 23-5 **L & ML:** Spray material with water while loading.
- ☐ 23-6 **MH:** Mix material with a water and tackifier mixture prior to loading.
- ☐ 23-7 **MH:** Spray material with a water and tackifier mixture while loading.
- ☐ 23-8 **H:** Mix material with a water and surfactant mixture prior to loading.
- ☑ 23-9 **H:** Spray material with a water and surfactant mixture while loading.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

CONSTRUCTION ACTIVITIES DUST CONTROL PERMIT SUPPLEMENTAL PERMITS/APPROVALS CHECKLIST

The following construction activities require permits or approval in addition to a Dust Control Permit. Permits or approvals must be obtained prior to conducting the activity. This form must be submitted with every Dust Mitigation Plan. *Check all activities that apply to the construction project.*

Activities requiring a Portable Source Permit:
(Comply with Portable Source requirements prior to installing this equipment on the project site.)

Operation of a: List Name of Company and/or Permit #

- ☐ powered crusher at temporary locations. _____
- ☐ powered screen at temporary locations. _____
- ☐ concrete batch plant at temporary locations. _____
- ☐ asphalt batch plant at temporary locations. _____

Activities requiring Supplemental Permit:
(Submit applicable supplemental forms. Asbestos survey is required for any size demo/remodel. NESHAP notification is required for ANY size demolition or for remodel if RACM is found.)

- ☐ Blasting to fracture rock, hardpan, or caliche.
- ☐ Blasting to implode a structure.
- ☐ Demolition of a structure greater than 1,000 square feet.
  - ☐ Structural remodeling
  - ☐ Structure relocation

Activities requiring Authority to Construct (ATC) Certificate and Operating Permit:
(An ATC must be obtained prior to installation of this equipment/facility.)

- ☐ Construction of or installation of any Emission Unit
  - ☐ Gasoline Dispensing Facility
  - ☐ Cooling Tower
  - ☐ Dry Cleaning Equipment
  - ☐ Plating Shop
  - ☐ Incinerator
  - ☐ Boiler
  - ☑ Emergency Standby Generator or Other Internal Combustion Engine
  - ☐ Woodworking Process Equipment
  - ☑ Power Generation Facility or Equipment
  - ☐ Crushing or Screening Stationary Source
  - ☐ Concrete or Asphalt Plant Stationary Source
  - ☐ Commercial Surface Coating Equipment including Paint Spray Booth
  - ☐ Other Source of PM_{10}, CO, VOC, NO_x, SO_2, Lead, Hazardous Air Pollutant, or Toxic Chemical Substance

- ☐ Activities Listed Above Do Not Apply to this Construction Project:

Fiber Optic Stringing

	Quantity	Disturbed Area Length (feet)	Disturbed Area Width (feet)	Ground disturbance per tower (acres)	Total Area disturbed (acres)	Approximate Dates of Activity
Telecom Path 2, Section 1						
Retrofit existing lattice steel structure	45	150	150	0.52	23.24	
Optical ground wire stringing setup area - tensioner	9	50	100	0.11	1.03	
Optical ground wire stringing setup area - puller	9	50	100	0.11	1.03	February 2012 - October 2012
TOTAL	63				***25.31***	Rounded up to 30 acres for permit

magenta line - fiber optic path
yellow triangles - 115 kV tower removal sites
yellow lines - roadways

mod 0 = 30.0
estimated acreage to be permitted, accurate acreage & maps will be provided prior to commencing construction activity

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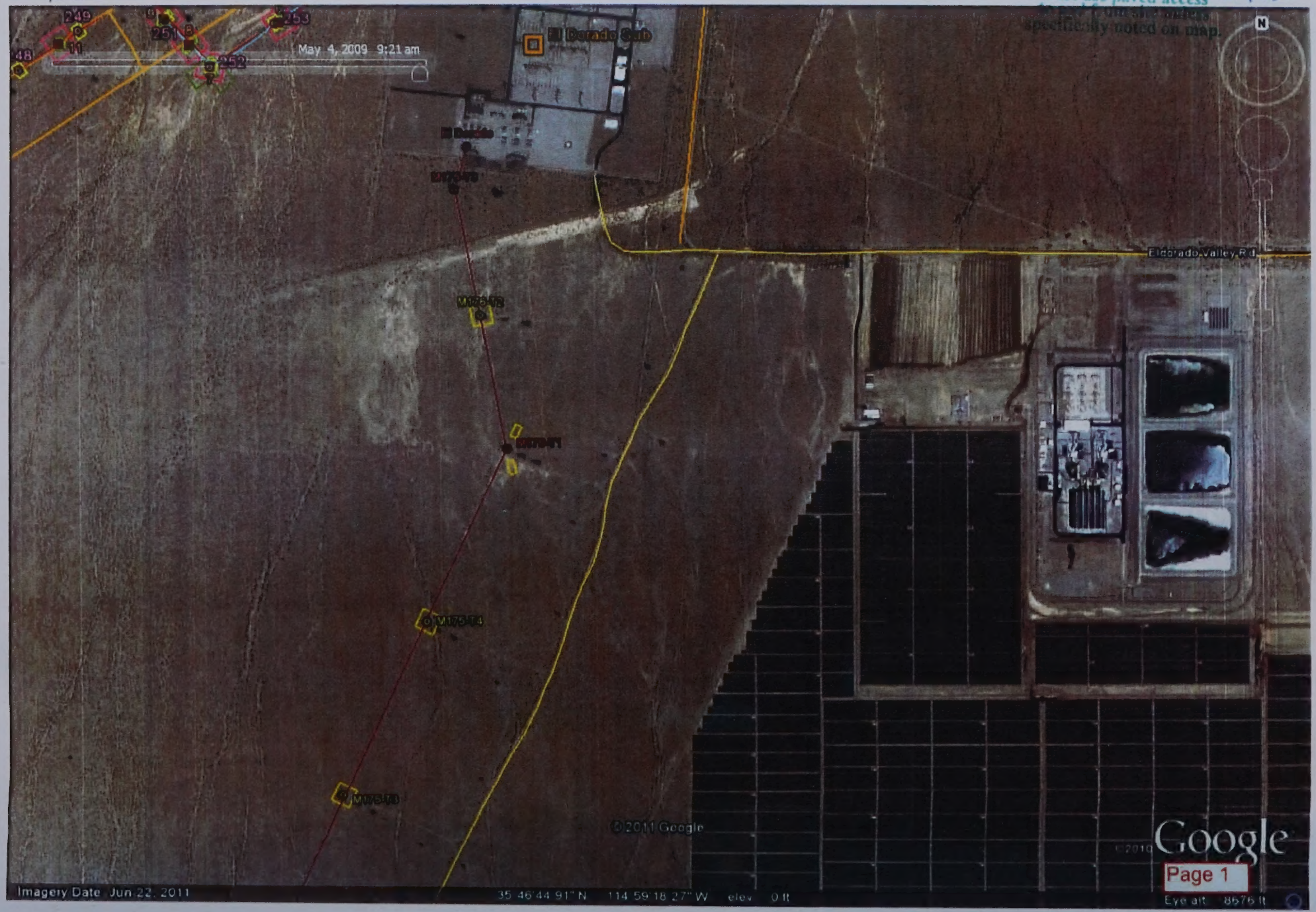
All construction traffic must use paved access 21402
specifically noted on map.



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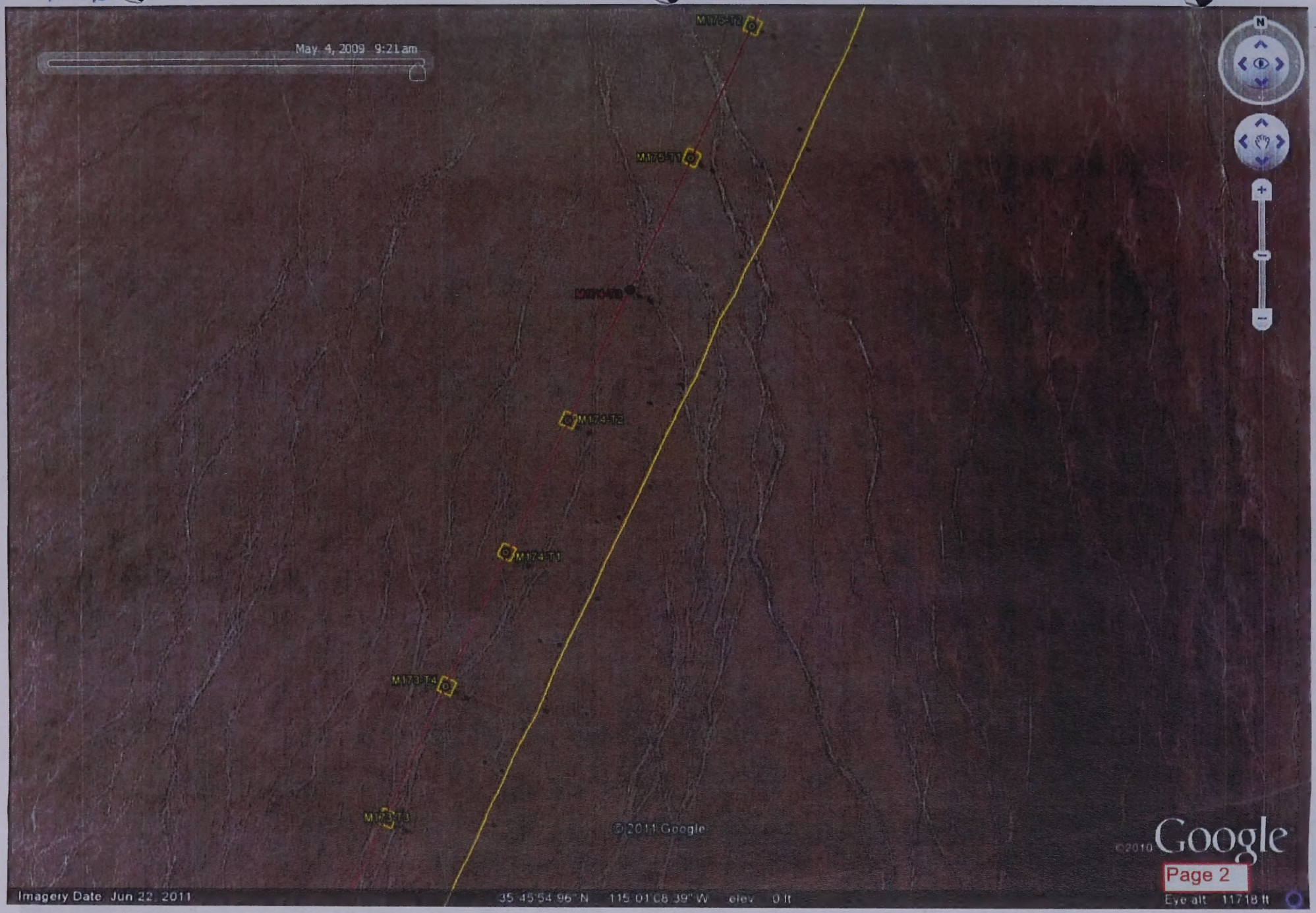
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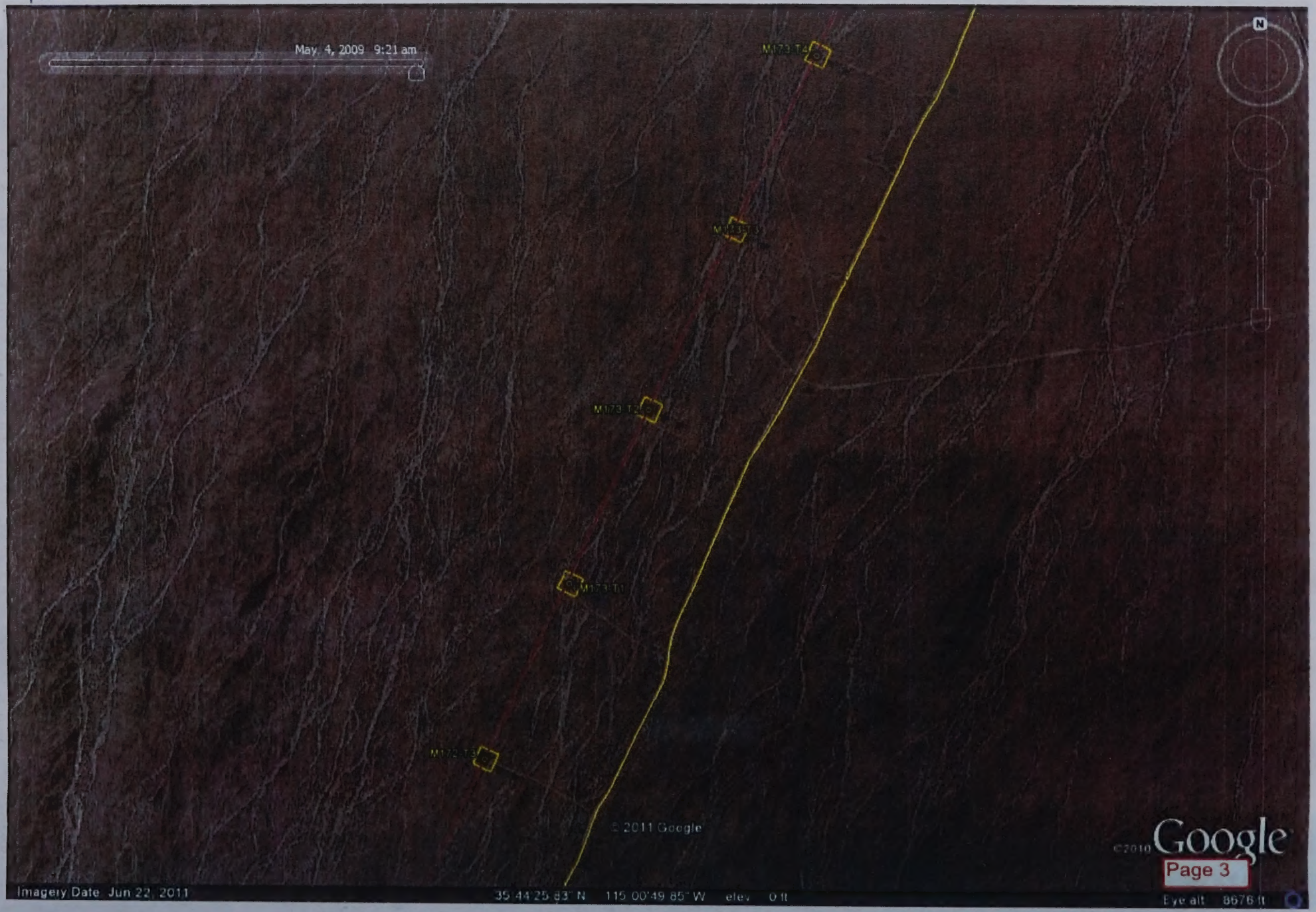
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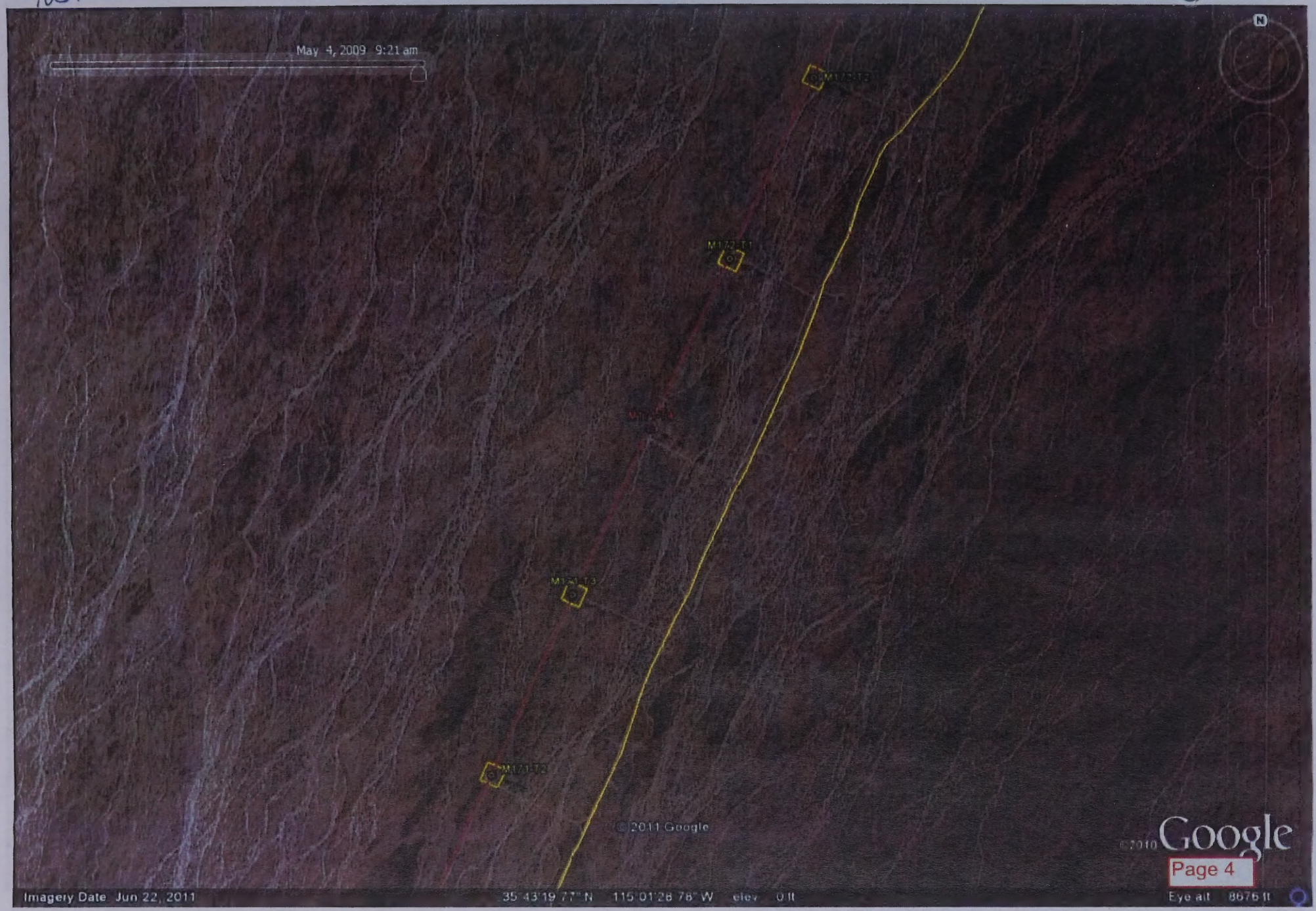
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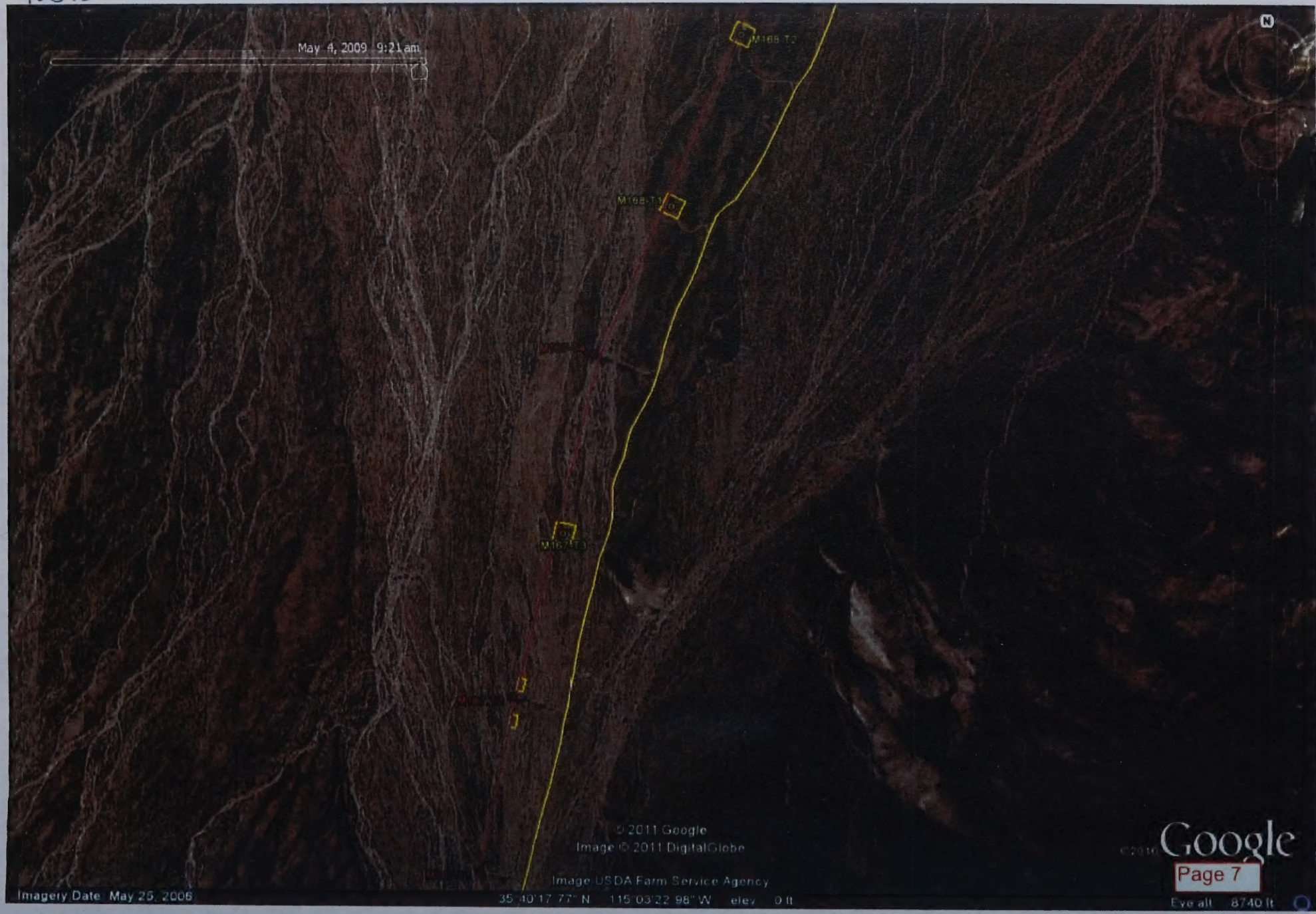
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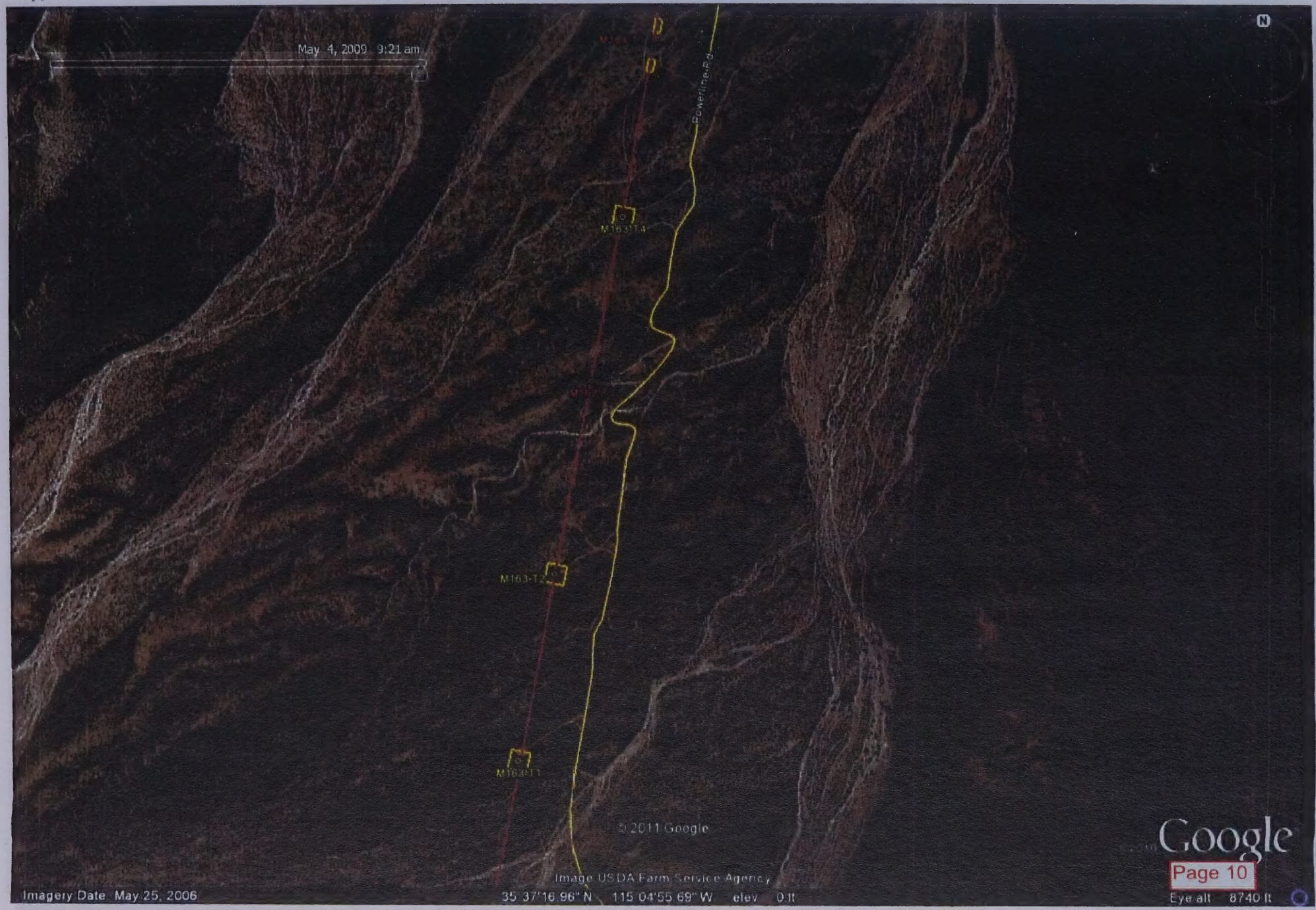
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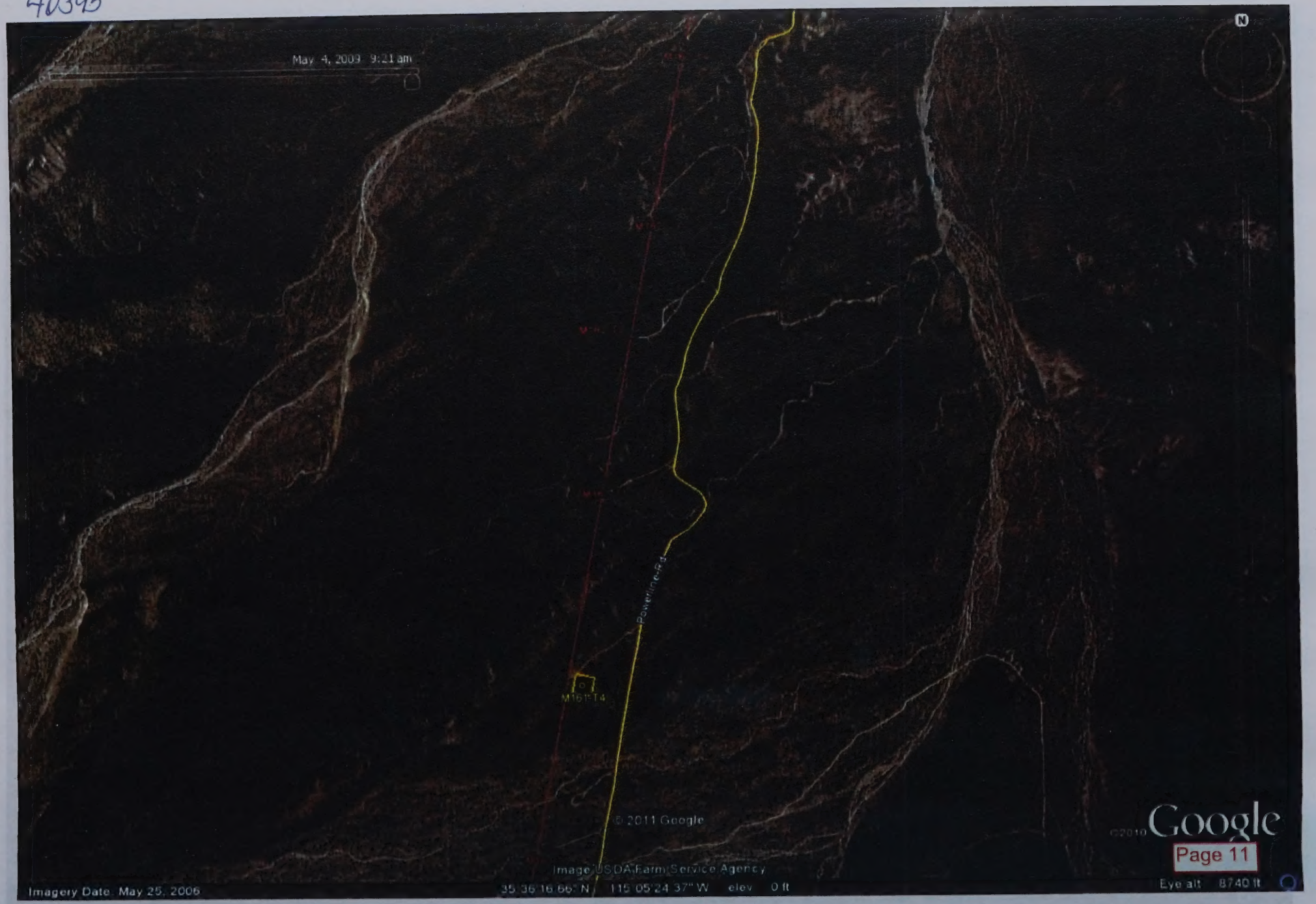
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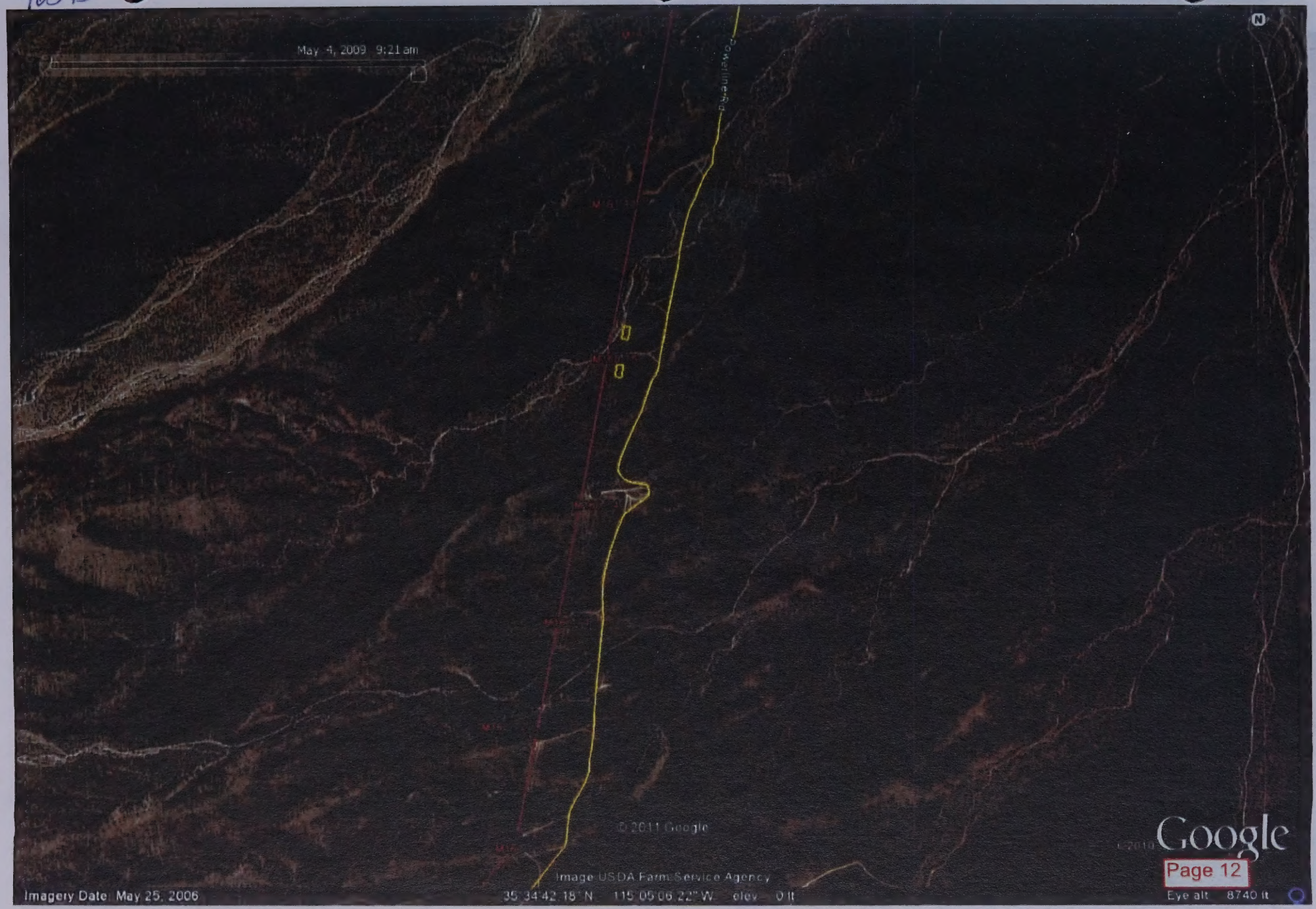
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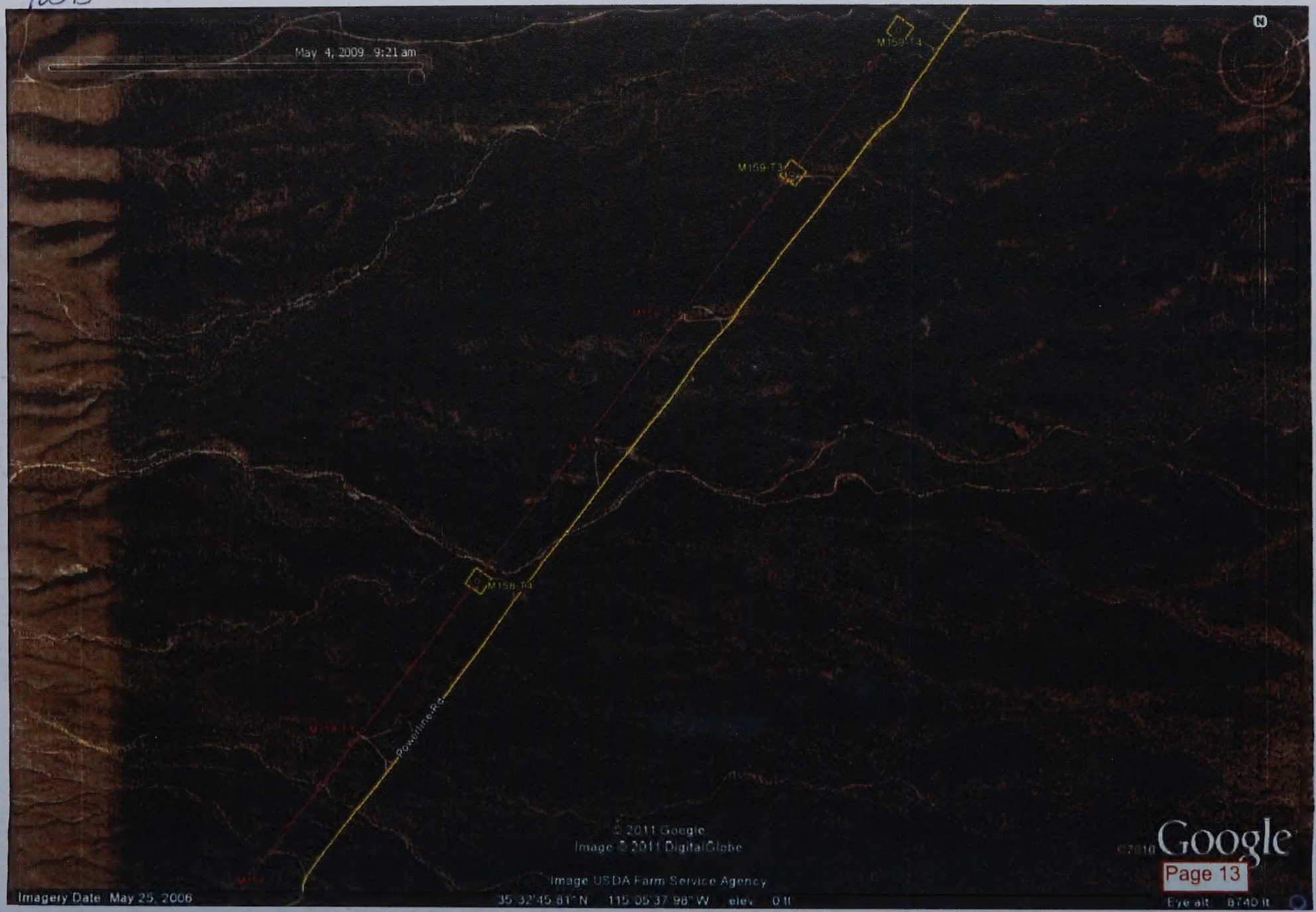
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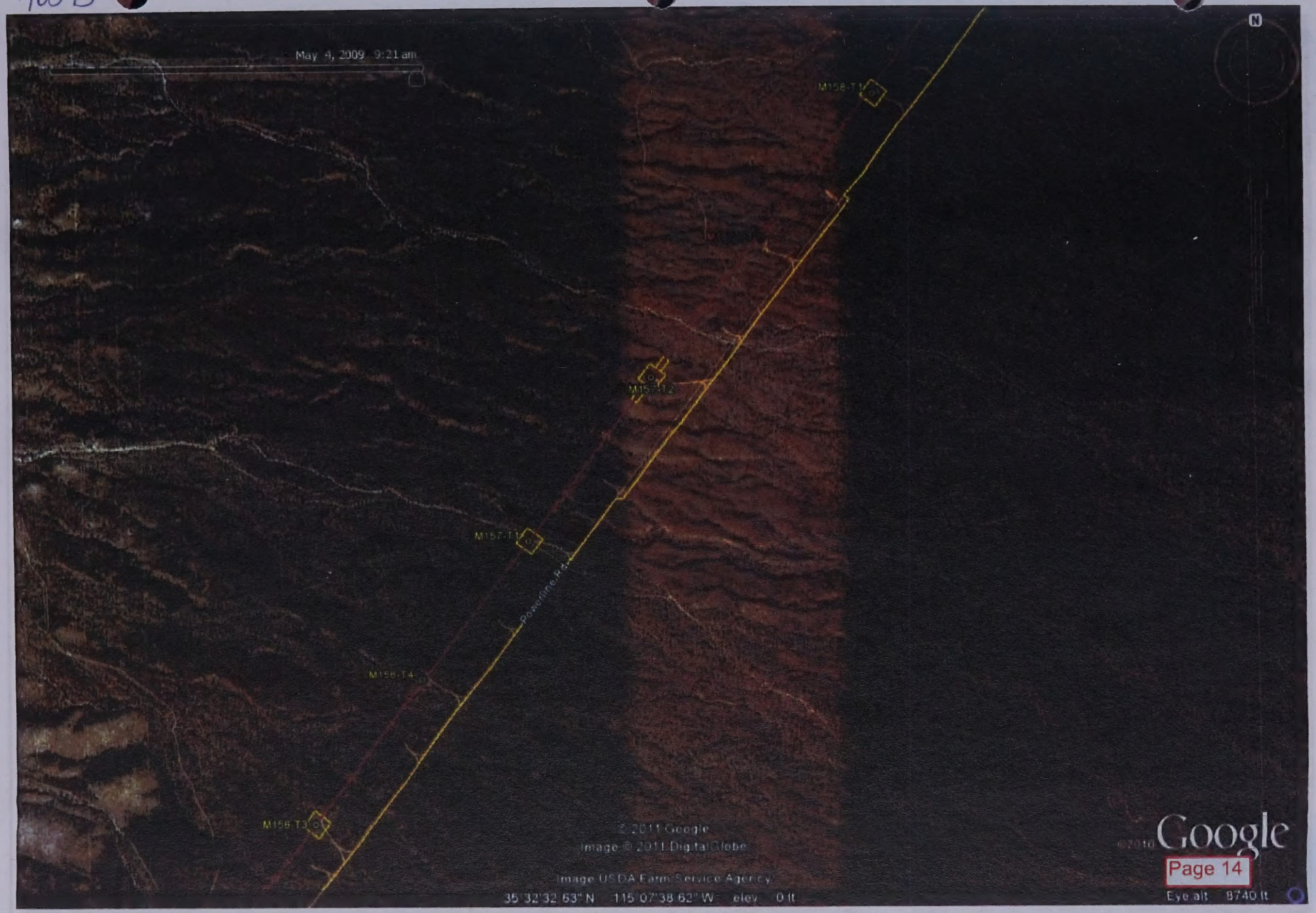

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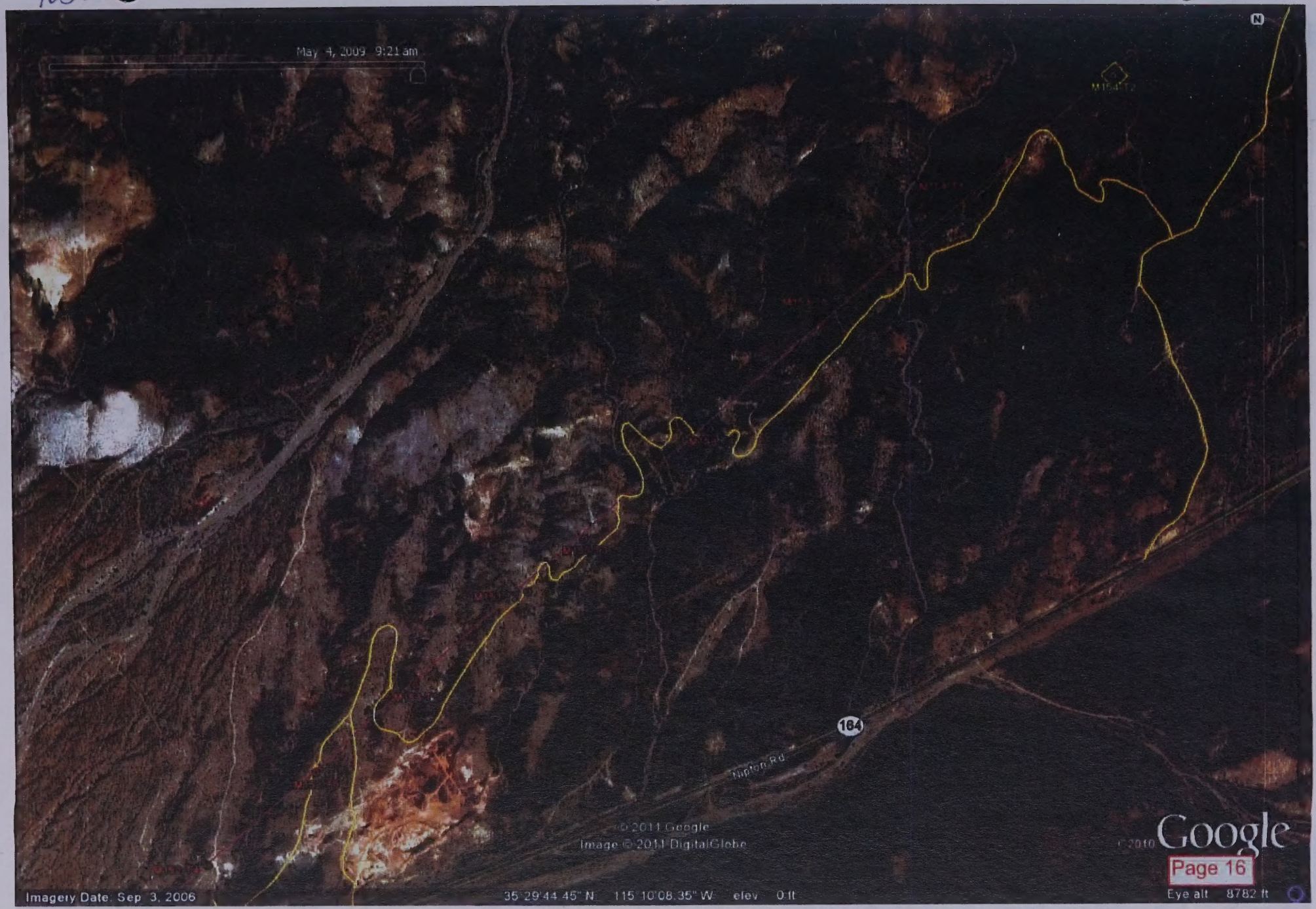
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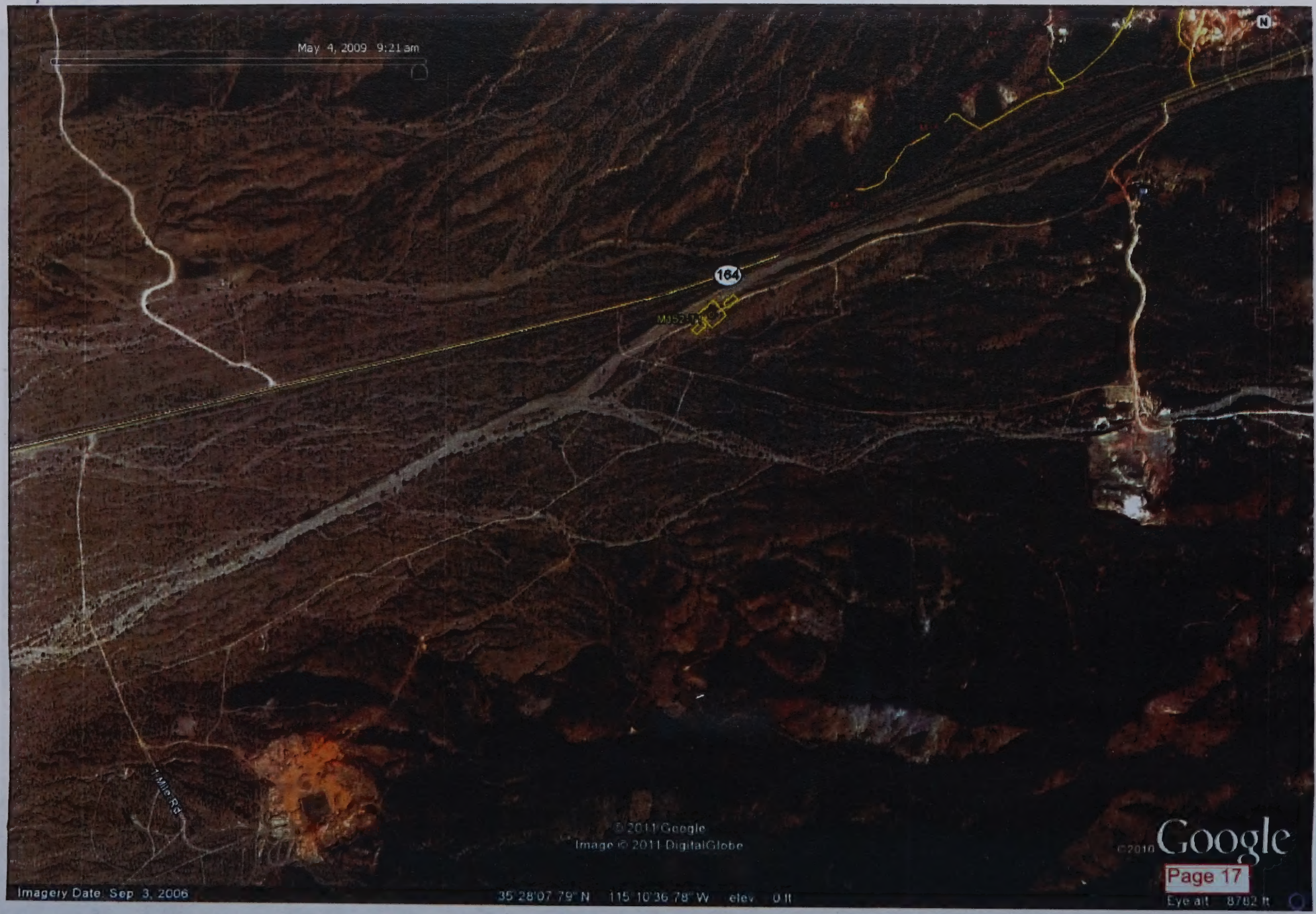
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Goodsprings
Sandy Valley
Jean
Searchlight
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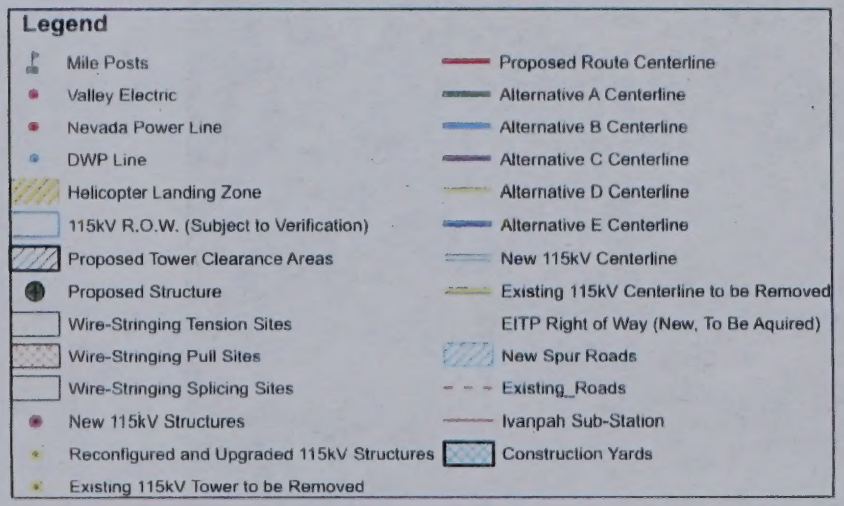
ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)

PRELIMINARY DESIGN
SUBJECT TO REVISION



NOTE: PRELIMINARY ENGINEERING LOCATIONS SHOWN. R.O.W. BOUNDARY, CONSTRUCTION AREAS, ROADS, ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

THIS DOCUMENT IS CONFIDENTIAL

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Details available in Road Story (4 permits).
EITP Subtransmission Line
Removal of 115 kV. towers
Installation of new 230 kV towers
Access Road work
Staging Areas
EITP Transmission Line

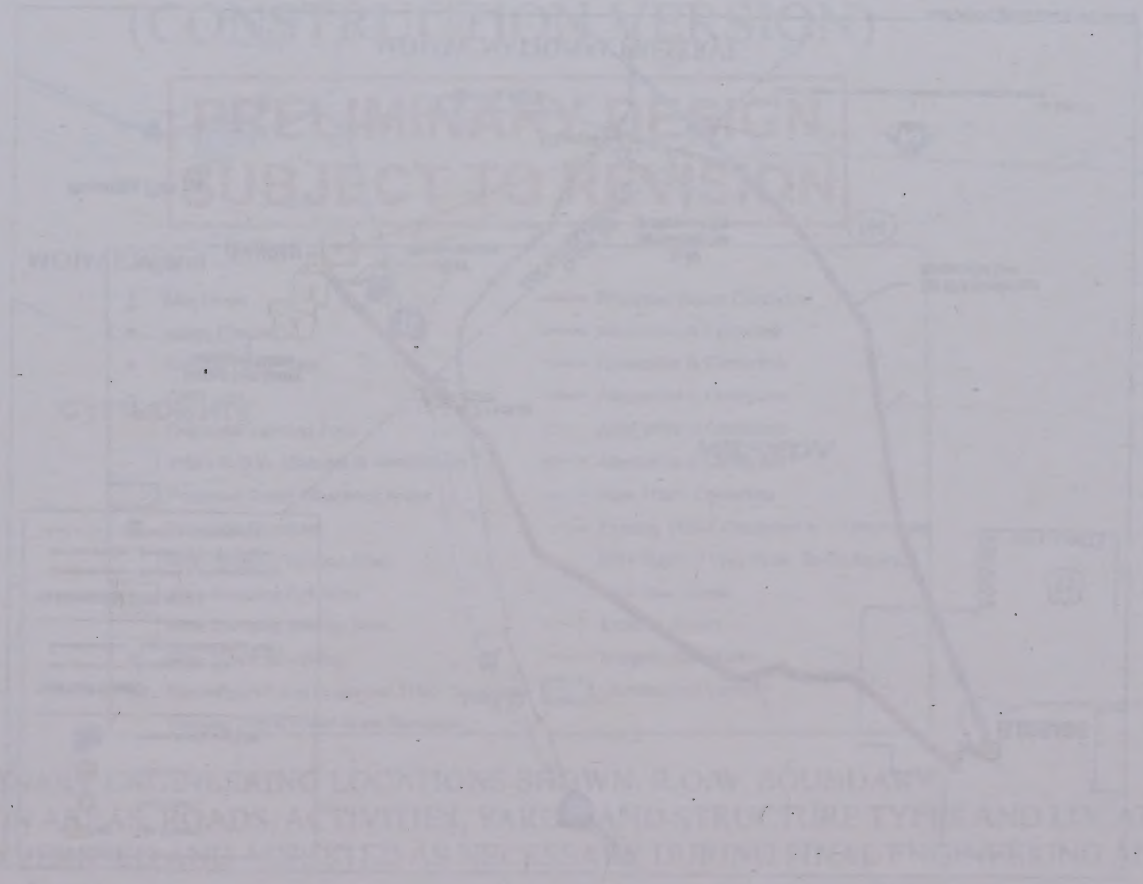
40395

EITP Underground Fiber Optics

Fiber Optic Stays

EITP Underground Fiber Optics

Figure 2-3 **Proposed Project**


PRELIMINARY DESIGN
SUBJECT TO REVISION

Eldorado-Ivanpah Transmission Project

Dust Control Permit

Fiber Optic UC – Clark County Permit 40394

Air Quality & Environmental Management

500 S. Grand Central Parkway, 1st floor
Las Vegas NV · 89155-1776
(702) 455-5942 · Fax (702) 383-9994

40394-0-1

CLARK COUNTY • LAS VEGAS • NORTH LAS VEGAS • BOULDER CITY • HENDERSON • MESQUITE

DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES INCLUDING SURFACE GRADING AND TRENCHING

THIS PERMIT DOES NOT EXEMPT THE PERMITTEE FROM COMPLIANCE WITH THE ENDANGERED SPECIES ACT

Permit Number: **40394** **Mod: 0**

PAYMENT INFORMATION: 20112545

Fee: **$1,120.00**

Balance Due: $ 0

Permittee and Project Information

Permittee: **Southern California Edison**
Permittee Address: **1218 South Fifth Avenue**
City, State, Zip: **Monrovia CA 91016** Fax No.:: **6264622774**
Project Name: **EITP - Fiber Optic Underground**
Project Address: **Highway 95 to Interstate 15**
Located In: *Township:* **25** *Range:* **62** *Section:* **1** EO Area: **SE/SW**
Acreage This Mod: **8** Total Acreage: **8**
Cross Streets: **Highway 95 to Interstate 15**

Project Contact(s)

Normal Hours: **Kirk Riehl**
Company:
Phone: **(714)814-5643**

After Hours: **Arnel "A.L." Wilson**
Company: **Southern California Edison**
Phone: **(626)302-3174**

Issue Date: 21-Sep-2011 **Expiration Date: 21-Sep-2012**

Effective Date:_____

Notes
ATC

- ○ Request Of Sign Waiver
- ○ Public Works Agreement
- ○ Closure Plan
- ○ Conditional Renewal

DUST CONTROL MEASURES MUST OCCUR 24 HOURS A DAY, 7 DAYS A WEEK

THIS PERMIT IS NOT VALID UNTIL ALL FEES ARE PAID IN FULL AND A COMPLETE COPY IS ON THE PROJECT SITE, INCLUDING CONDITIONS OF PERMIT AND DUST MITIGATION PLAN

It is a condition of the issuance of any operating permit required by the commission or pursuant to any local ordinance for the control of air pollution that the holder of the operating permit agrees to permit inspection of the premises to which the permit relates by any authorized officer of the department at any time during the holder's hours of operation without prior notice. This condition must be stated on each application form and operating permit. NRS 445B.580.

The issuance of this PERMIT does not relieve the PERMITTEE from compliance with all other applicable federal, state, county and local ordinances and regulations. Issuance of this PERMIT shall not be a defense to violations of any applicable ordinances or regulations.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

DAQEM Use Only

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2011 AUG 25 A 10:01

APPLICATION
DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. **Applicant/Permittee:**

☑ Property Owner ☐ Developer ☐ Prime Contractor ☐ Other _____

Name: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

E-mail Address: Project Manager: roger.~~shultz~~schultz@sce.com; AQ: arnel.wilson@sce.com

2. **Project:**

Name: EITP - Fiber Optic Underground

Address: _____ City: _____

Nearest major cross-streets: Highway 95 to Interstate 15

Township(s): 25 Range(s): 62 Section(s): 1

Assessor's Parcel number(s) (Attach map): 214 00 001 021

Project Description: Installation of underground fiber optic line, incl trenching & manholes

Project Acreage: 5.08 acres (rounded to the nearest 0.1 acre, all land that will be disturbed must be included in project acreage)

Permit fees: If the project acreage listed above contains a faction, the project acreage will be rounded up to the next whole number for fee purposes. The rounded up acreage (quantity) value will be used to assess the acreage fee for this permitting action.

Submit the total permit fee, with this application. Permit fees are non-refundable.

You must select one of the following three choices.

☐ This project does not require any offsite street or utility development.

☐ This project requires offsite street/utility development that is not included in this application, and will be added at a later date by modification or additional permit.

☑ This application includes offsite street/utility development. (Area must be marked on the accompanying parcel map. Check all that apply)

Utility Lateral ☑ less than 100 ft. ☐ greater than 100 ft. ☑ Half Street ☐ Full Street

☑ Curb / Entrance ☐ Entity Name and Number of Approved Offsite Plan / Permit / Easement: _____ ☐ Plan Pending ☐ Other

3. **Property Owner (if not applicant):**

Name: _____

4. **Point of Contact for dust control matters and to whom a NOTICE OF VIOLATION should be sent if necessary:**

Name: Arnel "A.L." Wilson Company: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: ____ Fax: (626) 462-2774

Cellular/Pager: (626) 302-3174 After Hours Phone: (714) 915-1525

5. **On-site Superintendent/Supervisor/Foreman contact:**

Name: Kirk ~~Real~~ Richl Company: ____

On-site phone: (714) 814-5643 Cellular/Pager: (714) 814-5643

DAQEM Dust Class Certification/Card #: DC 0510150 Expiration date: 5-28-13

Have all other on-site supervisory personnel attended the DAQEM Dust Class? ☐ Yes ☒ No

If no, all on-site supervisory personnel must attend a DAQEM Dust Class within 30 days.

7. **By signing this permit application I certify that:**

A. **I am authorized, on behalf of the individual or company listed in Section 1, as Applicant/Permittee, to apply for their Dust Control Permit and to commit to all of the terms and conditions of the requested permit.**

B. **Construction activities will be limited to lands that the applicant/permittee either owns or is authorized to use for construction activities. The permit issued subsequent to this application is not a substitute for obtaining the property owners permission to use his land. Issuance of a Dust Control Permit is intended only for the purpose of controlling emissions of air pollutants and assuring compliance with Air Quality Regulations. The applicant/permittee agrees to hold harmless, indemnify, and defend Clark County, its employees and assigns from any claims that may arise due to any unauthorized use of land for construction activities.**

C. **The permittee accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this permit, comply with the terms and conditions of the permit, the dust mitigation plan and all applicable Air Quality Regulations.**

D. **The applicant/permittee understands that it is a condition of the permit that the permittee agrees to allow the inspection of the site for compliance with the terms and conditions of the permit and Air Quality Regulations at any time during the permittee's hours of operation by a DAQEM officer without prior notice or at any time pursuant to the investigation of a complaint or upon direct observation of emission and/or failure to maintain Best Management Practices.**

E. **I understand that any material misrepresentation made in this application may invalidate the permit and that Clark County may pursue enforcement action against me. In addition, I understand any willful misrepresentation may result in criminal penalties. I declare under penalty of perjury that the foregoing is true and correct.**

Executed on:

August 23, 2011 ____

DATE SIGNATURE

Arnel L. Wilson Air Quality Specialist, SCE

PRINTED NAME TITLE AND COMPANY NAME

Application completed by, if not completed by signatory (Please Print):

Name _____ Phone Number _____ Ext. _____

PAYMENT INFORMATION **TO BE COMPLETED BY THE APPLICANT**

PAYING BY (Please Print)

☒ CASH $420

☑ CHECK CHECK # 0041194703

NAME AND ADDRESS AS IT APPEARS ON CHECK:

So. Calif Edison
PO Box 700
Rosemead, Ca 91770

Telephone #: _____

☑ CREDIT CARD LAST FOUR DIGITS OF CREDIT CARD NUMBER: ~~6538~~ 8

EXACT NAME AS IT APPEARS ON CREDIT CARD: ~~Anne~~ A. Wilson
~~So. Calif Edison~~

FOR DAQEM USE ONLY

9/21/2011 ISSUE DATE | JS 40394 ISSUED BY | 20112545 POS #

8/25/11 DATE PAID | MK RECEIVED BY

DAQEM REVIEW: _____ DATE: 9-20-11

BLASTING APPROVAL (if applicable): _____ DATE: _____

DEMOLITION APPROVAL (if applicable): _____ DATE: _____

COMPLIANCE AREA ASSIGNMENT: SE & SW Hydrographic Area: 167-Eldorado Valley

☐ Airport ☐ Blasting ☐ Commercial ☐ Demo-Structure ☐ Demo–Other ☐ Staging/Stockpiling

☐ Highway ☐ Schools ☐ Residential ☐ Public Works ☐ Flood Detention ☐ Utilities ☑ Misc.

Protecting the air we share

Air Quality

DUST MITIGATION PLAN FOR ALL PROJECTS

Project Name: EITP - Fiber Optic Underground

Permittee Name: Southern California Edison

Identify the Project Soil "Particulate Emission Potential" (check all that apply):

Using silt and optimum moisture content to determine the particulate emission potential (PEP) is the preferred method.

☑ PEP determined using generalized PEP determination maps included in the Dust Control Handbook.

☐ PEP determined using silt vs. optimum moisture table in Figure 2 of the Dust Control Handbook.

Percentage of silt through a #200 sieve: ___% Optimum moisture content: ___%

PEP for this project is determined to be:

☑ High ☐ Moderate High ☑ Moderate Low ☐ Low

in lieu of DCP12

Water source: ☐ Hydrant with Jones Valve ☐ Fire hose ☑ Water trucks/pulls ☐ Well
☑ Stand tanks ☐ Ponds ☐ Other:_____

PROJECT ACTIVITIES CHECKLIST

Instructions:

Place a check mark in the box to the right of each Project Activity that will occur on your project. If additional soil disturbing activities that are not on the checklist are to be included in the project, list them on a separate page and provide a description. For a more complete description of the listed activities, see the Control Measures Selection Pages (Form DCP03) that follow or refer to the Best Management Practices for dust control in the Dust Control Handbook.

BMP 10 Disturbed Soil and BMP 20 Trackout Prevention and Cleanup must be marked for every Dust Mitigation Plan.

CONTROL MEASURES SELECTION PAGES

Instructions:

For each project activity that you have selected on the Project Activities Checklist you must include the corresponding Control Measures Selection Page. Read and understand each item listed as a "Requirement" on these included pages. Where control measure options are listed, place a check in the box in front of the control measure you will use to meet that requirement. You must select at least one control measure where a choice is listed. In addition you must select the control measure that corresponds to your PEP as listed above, if applicable.

NOTE: PROJECTS 10 ACRES AND LARGER MUST COMPLETE A SUPPLEMENT TO THE DUST MITIGARTION PLAN (APPENDIX B-1 AND B-2).

Protecting the air we share

Air Quality

PROJECT ACTIVITIES CHECKLIST

Project Name: EITP - Fiber Optic Underground

Permittee Name: Southern California Edison

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY COMPLETE THE CORRESPONDING CONTROL MEASURES SELECTION PAGE AND INCLUDE WITH APPLICATION.

BMP	Project Activity	Check All That Apply
01	Backfilling Filling area previously excavated or trenched.	☑
02	Blasting - Abrasive Sandblasting and/or abrasive blasting.	☐
03	Blasting Soil & Rock Explosive blasting of soil and rock.	☐
04	Clearing & Grubbing Clearing and grubbing for site preparation and vacant land cleanup.	☑
05	Clearing Forms, Foundations and Slabs Clearing and cleaning of forms, foundations and slabs prior to pouring concrete.	☐
06	Crushing Crushing of construction and demolition debris, rock and soil.	☐
07	Cut and/or Fill Cut and/or fill soils for site grade preparation.	☐
08	Demolition - Implosion Implosive demolition of a structure, using explosives.	☐
09	Demolition - Mechanical/Manual Mechanical and manual demolition of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls and/or removal of transit pipe	☐
10	Disturbed Soil **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Disturbed soil throughout project including between structures.	☑
11	Disturbed Land - Long Term Stabilization Large tracts of disturbed land that will not have continuing activity for more than 30 days.	☑
12	Dust Suppressants - Selection and Use Selection and use of chemical and organic dust suppressing agents and other dust palliatives.	☐
13	Importing/Exporting Materials Importing or exporting of soil, aggregate, decorative rock, debris, Type II and other bulk material.	☐
14	Landscaping Installation of sod, decorative rock, desert or other landscape material.	☐
15	Paving/Subgrade Preparation Subgrade preparation for paving streets, parking lots, etc.	☐
16	Sawing/Cutting Material Sawing or cutting materials such as concrete, asphalt, block or pipe.	☐
17	Screening Screening of rock, soil or construction debris.	☐
18	Staging Areas Staging areas, equipment storage, vehicle parking lots, and material storage areas.	☑
19	Stockpiles Stockpiling of materials, such as Type II, other soils, rock or debris, for future use or export.	☐
20	Trackout Prevention and Cleanup **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Prevention and cleanup of mud, silt and soil tracked out onto paved roads.	☑
21	Traffic - Unpaved Routes and Parking Construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.	☑
22	Trenching Trenching with track or wheel mounted excavator, shovel, backhoe or trencher.	☑
23	Truck Loading Loading trucks with materials including construction and demolition debris, rock and soil.	☐

EITP - Fiber Optic Underground

BACKFILLING — BMP 01

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize backfill material when not actively handling.

- ☑ 01-1 Water backfill material to maintain moisture or to form crust when not actively handling.
- ☐ 01-2 Apply and maintain a dust palliative to backfill material to form crust when not actively handling.
- ☐ 01-3 Cover or enclose backfill material when not actively handling.

Requirement: Stabilize backfill material during handling.

- ☑ 01-4 Empty loader bucket slowly and minimize drop height from loader bucket.
- ☐ 01-5 Dedicate water truck or large hose to backfilling equipment and apply water as needed.

Note: Select at least one of the above; in addition the appropriate control measure for your soil type must be selected from the following.

- ☐ 01-6 **L:** Mix moist soil with dry soil until the optimum moisture is reached.
- ☑ 01-7 **ML:** Apply and mix water into the backfill material until optimum moisture is reached.
- ☐ 01-8 **MH:** Apply and mix water and tackifier solution into the backfill material until optimum moisture is reached.
- ☑ 01-9 **H:** Apply and mix water and surfactant solution into the backfill material until optimum moisture is reached.

Requirement: Stabilize soil at completion of backfilling activity.

- ☑ 01-10 Apply water and maintain disturbed soils in a stable condition until permanent stabilization is complete.
- ☐ 01-11 Apply and maintain a dust palliative on disturbed soils to form a crust following backfilling activity.

Requirement: Stabilize material while using pipe padder equipment.

- ☑ 01-12 Mix moist soil with dry soil until the optimum moisture is reached.
- ☐ 01-13 Dedicate water truck or large hose to equipment and apply water as needed.

EITP - Fiber Optic Underground

CLEARING AND GRUBBING — BMP 04

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 04-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 04-2 Apply and maintain a dust palliative on surface soils where support equipment and vehicles will operate.

Requirement: Stabilize soil during clearing and grubbing activities.

- ☑ 04-3 **L & ML:** Apply water during clearing and grubbing activities.
- ☐ 04-4 **MH:** Apply water and tackifier mixture during clearing and grubbing activities.
- ☑ 04-5 **H:** Apply water and surfactant mixture during clearing and grubbing activities.

Requirement: Stabilize disturbed soil immediately after clearing and grubbing activities.

- ☑ 04-6 Water disturbed soils to form crust immediately following clearing and grubbing activities.
- ☐ 04-7 Apply and maintain a dust palliative on disturbed soils to form crust immediately following clearing and grubbing activities.

Recommendations: Maintain live perennial vegetation and desert pavement where possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Fiber Optic Underground

DISTURBED SOIL — BMP 10

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.

Requirement: Limit vehicle traffic and disturbance of soils where possible.

☑ 10-1 Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

Requirement: Stabilize and maintain stability of all disturbed soil throughout construction site.

Note: You must choose one or more of the following.

☑ 10-2 Apply water to stabilize disturbed soils. Soils must be kept in a sufficiently damp, crusted or covered condition.

☐ 10-3 Apply and maintain a dust palliative based on soil type and future plans.

Requirement: Soil conditions, including preventive and corrective measures, must be recorded every day the construction project is active.

☑ 10-4 Record soil conditions and dust control actions in daily project records.

Recommendations: If interior block walls are planned, install as early in the construction as possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Fiber Optic Underground

DISTURBED LAND – Long-Term Stabilization — BMP 11

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize soil to meet standards required by Air Quality Regulation Section 90.

- ☑ 11-1 Apply and maintain a dust palliative on disturbed soils for long-term stabilization. contingency
- ☐ 11-2 Stabilize disturbed soil with vegetation for long-term stabilization.
- ☐ 11-3 Pave or apply surface rock for long-term stabilization.
- ☐ 11-4 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☑ 11-5 Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization.

Requirement: Prevent access to limit soil disturbance.

- ☑ 11-6 Prevent access by fencing, ditches, vegetation, berms or other suitable barrier or means approved by the Control Officer.

Recommendations: Plant perimeter vegetation early. Use of native and drought-tolerant plants with greater than 50 % silhouette area is encouraged.

See also: BMP 12: DUST SUPPRESSANT, DUST PALLIATIVE AND SURFACTANT – Selection and Use.

EITP - Fiber Optic Underground

STAGING AREAS — BMP 18

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 18-1 Limit vehicle speeds to 15 mph in the staging area and on all unpaved access routes.
- ☐ 18-2 Apply and maintain dust suppressant on all vehicle traffic areas in the staging areas and unpaved access routes.

Requirement: Stabilize staging area soils during use.

- ☑ 18-3 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 18-4 Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.

Requirement: Stabilize staging area soils at project completion.

- ☐ 18-5 Apply a dust palliative.
- ☑ 18-6 Apply screened or washed Type II aggregate.
- ☐ 18-7 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☐ 18-8 Pave with thin paving.
- ☐ 18-9 Completed project will cover staging area with buildings, paving, and/or landscaping.
- ☐ 18-10 Apply water to form adequate crust and prevent access.

Recommendations: Limit size of staging areas.

Limit ingress and egress points.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP

EITP - Fiber Optic Underground

TRACKOUT PREVENTION AND CLEANUP — BMP 20

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: In soils that have a PEP classification of "High", pave construction activities roadways as early as possible.

Requirement: Use of soil to create a ramp for vehicle access over a curb is prohibited.

Requirement: Trackout conditions, including preventive and corrective measures, must be recorded daily for every day that the construction project access is used by vehicles.

☑ 20-1 Record soil conditions and dust control actions in daily project records.

Requirement: Prevent dust from trackout.

☐ 20-2 Immediately clean trackout from paved surfaces to maintain dust control. Trackout must not extend 50 feet or more.

☑ 20-3 Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. Trackout must not extend 50 feet or more and must be cleaned daily, at minimum.

Requirement: Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or travel routes intersect.

☐ 20-4 Install gravel pad(s) consisting of 1" to 3" rough diameter, clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.

☐ 20-5 Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.

☐ 20-6 Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.

☑ 20-7 Install wheel shakers in the event that trackout cannot be controlled with gravel pads.

☐ 20-8 Install wheel washer in the event that trackout cannot be controlled with gravel pads and wheel shakers.

☐ 20-9 Motorized vehicles will only operate on paved surfaces.

(Continued on next page)

Requirement: All exiting traffic must be routed over selected trackout control device(s).

- [x] 20-10 Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).
- [ ] 20-11 Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.

EITP - Fiber Optic Underground

TRAFFIC – Unpaved Routes and Parking Areas — BMP 21

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 21-1 Limit vehicle speeds to 15 mph on all unpaved routes and parking areas.
- ☐ 21-2 Apply and maintain dust palliative on all vehicle travel areas.

Requirement: Stabilize all haul routes.

- ☑ 21-3 Apply water to haul routes and maintain in a stabilized condition.
- ☐ 21-4 Apply a dust palliative to haul routes and maintain in a stabilized condition.
- ☐ 21-5 Apply gravel to haul routes and maintain in a stabilized condition.
- ☐ 21-6 Supplement dust palliative or aggregate applications with watering, if necessary.

Requirement: Stabilize all off-road and parking areas.

- ☑ 21-7 Apply water to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-8 Apply gravel to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-9 Apply recycled asphalt (or other suitable material) to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-10 Apply and maintain a dust palliative (designed for vehicle traffic) to off-road traffic and parking areas and maintain in a stabilized condition.

Recommendations: Use of bumps or dips for speed control is encouraged.

Apply paving as soon as possible to all future roadway areas for PEP categories other than "High".

EITP - Fiber Optic Underground

TRENCHING — BMP 22

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where trenching equipment, support equipment and vehicles will operate.

- ☑ 22-1 Pre-water and maintain surface soils in a stabilized condition where trenching equipment, support equipment and vehicles will operate.
- ☐ 22-2 Apply and maintain a dust palliative to surface soils where trenching equipment, support equipment and vehicles will operate.

Requirement: Presoak soils prior to trenching activities.

- ☐ 22-3 Pre-water surface, pre-trench to 18" depth, soak soils via pre-trench prior to deep trenching.
- ☐ 22-4 **L & ML:** Presoak soil with water using sprinklers or wobblers.
- ☑ 22-5 **L & ML:** Presoak with water, using water truck and/or water pull.
- ☐ 22-6 **MH:** Presoak soil with a water and tackifier mixture using water pulls and/or water trucks.
- ☐ 22-7 **MH:** Presoak soil with a water and tackifier mixture using sprinklers or wobblers.
- ☑ 22-8 **H:** Presoak soil with a water and surfactant mixture using water pulls and/or water trucks.
- ☐ 22-9 **H:** Presoak soil with a water and surfactant mixture using sprinklers or wobblers.

Requirement: Stabilize soil during trenching activities.

- ☑ 22-10 **L & ML:** Complete trenching with a dedicated water truck or large hose maintaining water as needed to prevent dust.
- ☐ 22-11 **L & ML:** Use spray nozzles mounted on trenching machine.
- ☐ 22-12 **MH:** Complete trenching with a dedicated water truck or large hose maintaining a water and tackifier mixture as needed to prevent dust.
- ☑ 22-13 **H:** Complete trenching with a dedicated water truck or large hose maintaining a water and surfactant mixture as needed to prevent dust.

(Continued on next page)

Requirement: Stabilize soils at the completion of trenching activities.

☑ 22-14 Use water to form crust on excavated soil windrow as it is formed.

☐ 22-15 Use dust palliative to form crust on excavated soil windrow as it is formed.

Recommendations: Wash mud and soil from equipment at completion of trench to prevent crusting and drying of soil on equipment.

See also: BMP 01: BACKFILLING, if applicable.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

CONSTRUCTION ACTIVITIES DUST CONTROL PERMIT SUPPLEMENTAL PERMITS/APPROVALS CHECKLIST

The following construction activities require permits or approval in addition to a Dust Control Permit. Permits or approvals must be obtained prior to conducting the activity. This form must be submitted with every Dust Mitigation Plan. *Check all activities that apply to the construction project.*

Activities requiring a Portable Source Permit:
(Comply with Portable Source requirements prior to installing this equipment on the project site.)

Operation of a: List Name of Company and/or Permit #

- ☐ powered crusher at temporary locations. _____
- ☐ powered screen at temporary locations. _____
- ☐ concrete batch plant at temporary locations. _____
- ☐ asphalt batch plant at temporary locations. _____

Activities requiring Supplemental Permit:
(Submit applicable supplemental forms. Asbestos survey is required for any size demo/remodel. NESHAP notification is required for ANY size demolition or for remodel if RACM is found.)

- ☐ Blasting to fracture rock, hardpan, or caliche.
- ☐ Blasting to implode a structure.
- ☐ Demolition of a structure greater than 1,000 square feet.
  - ☐ Structural remodeling
  - ☐ Structure relocation

Activities requiring Authority to Construct (ATC) Certificate and Operating Permit:
(An ATC must be obtained prior to installation of this equipment/facility.)

- ☐ Construction of or installation of any Emission Unit
  - ☐ Gasoline Dispensing Facility
  - ☐ Cooling Tower
  - ☐ Dry Cleaning Equipment
  - ☐ Plating Shop
  - ☐ Incinerator
  - ☐ Boiler
  - ☑ Emergency Standby Generator or Other Internal Combustion Engine
  - ☐ Woodworking Process Equipment
  - ☑ Power Generation Facility or Equipment
  - ☐ Crushing or Screening Stationary Source
  - ☐ Concrete or Asphalt Plant Stationary Source
  - ☐ Commercial Surface Coating Equipment including Paint Spray Booth
  - ☐ Other Source of PM_{10}, CO, VOC, NO_x, SO_2, Lead, Hazardous Air Pollutant, or Toxic Chemical Substance

- ☐ Activities Listed Above Do Not Apply to this Construction Project:

Fiber Optic Underground

	Quantity	Disturbed Area Length (feet)	Disturbed Area Width (feet)	Ground disturbance per tower (acres)	Total Area disturbed (acres)	Approximate Dates of Activity
Distribution Line Loop						
Underground trench/duct for conduit	1	5,280	~~25~~	~~0.24~~ 3.03	~~0.24~~ 3.03	
Underground manhole installation	6	10	15	0.00	0.02	
Work area for underground manholes pulling area	6	40	60	0.06	0.33	
Work area pulling of 1,600 ft of 1/0 aluminum conductor steel reinforced pole line construction	10	40	60	0.06	0.55	
TOTAL	23				~~1.14~~ 3.93	May 2012 - July 2012
Telecom Path 1						
Underground trench/duct for fiber entrance to Eldorado Substation	1	500	~~1.5~~ 25	~~0.02~~ 0.29	~~0.02~~ 0.29	
Work area outside Eldorado Substation	1	40	60	0.06	0.06	
TOTAL	2				~~0.07~~ .35	March 2012 - October 2012
Telecom Path 2, Section 2						
Work area at 500-kV tower M172	1	40	80	0.07	0.07	
2-mile underground fiber cable duct (NV side only)	1	6.8	10,560	1.65	1.65	
Underground vaults	21	~~6~~ 50	~~6~~ 50	~~0.00~~ 1.21	~~0.02~~ 1.21	
Work area for underground vaults and fiber pulling area	5	40	60	0.06	0.28	
TOTAL	28				~~2.01~~ 3.21	February 2012 - October 2012
				FIBER OPTIC UNDERGROUND TOTAL	~~3.2~~ 7.5	Rounded up to ~~5~~ 8 acres for permit mod 0 = 8.0

Notes:
Does not include Telecom Path 2, Section 1. Path 2, Section 1 is considered Fiber Optic Stringing.

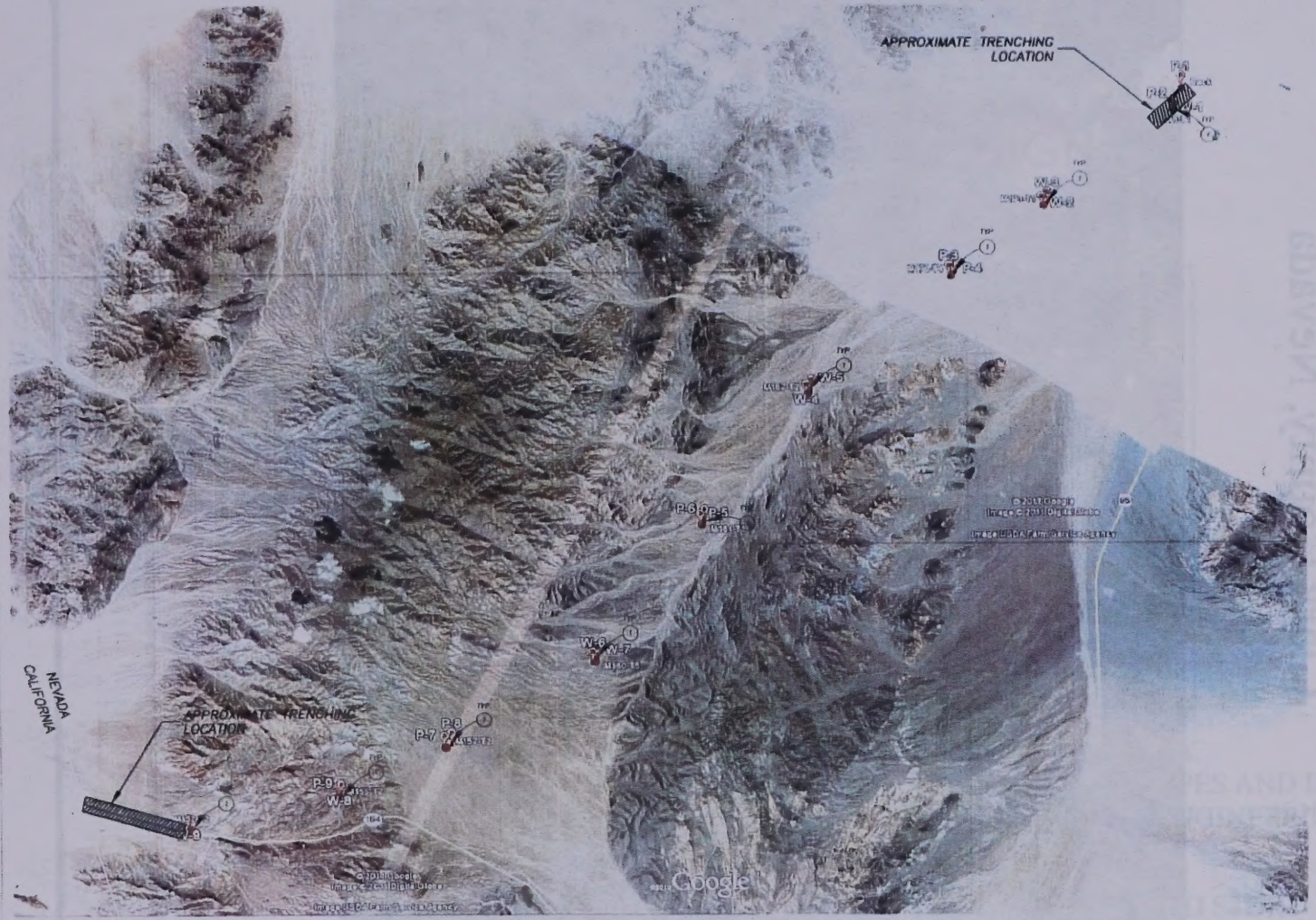
Description:
Telecom Path 2, Section 2 - The underground duct will be installed in the shoulder of the existing roadside ROW, parallel to the north side of Nipton Road. The underground optical ground wire (OPGW) will be installed approximately 3 feet from the northerly edge of the existing AC pavement. The trench will be approximately 2 feet wide by 30 inches deep with the soil stockpiled for re-use.
Distribution Line Loop and Telecom Path 1 - The Eldorado-Lugo 500 kV transmission lines will have an underground and overhead dip into the new 220 kV to 500 kV racks at the Eldorado Substation.

Estimated acreage to be permitted, accurate acreage & maps will be provided prior to commencing construction activity.

403411

SITE MAP
FOR
ELDORADO-IVANPAH TRANSMISSION PROJECT
TELECOMMUNICATION CONSTRUCTION ACTIVITIES
FROM ELDORADO SUBSTATION TO CA/NV BORDER AT NIPTON ROAD
CLARK COUNTY, NEVADA

All construction traffic must use paved access to and from site unless specifically noted on map.



WATER POLLUTION CONTROL NOTES

1. INSTALL SILT ROLLS OR BERMS AND LINEAR BARRIER PER CASQA BMP SE-5, SR-5E-1, RESPECTIVELY.
   NOTE: SEE SHEET 2 FOR PULLING AND SPOOLING SITE TYPICAL LINEAR BARRIER DETAIL

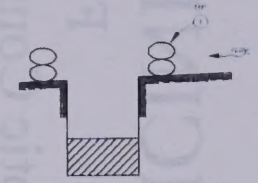
LEGEND

- LWM — LIQUID WASTE MANAGEMENT
- CWM — CONCRETE WASHOUT
- SWM — SANITARY WASTE MANAGEMENT
- SP — STOCKPILE MANAGEMENT
- PULLING SITE
- WIRE SPOOLING SITE
- TOWER LOCATION
- TRENCHING ACTIVITIES

NOTE: THIS PROJECT WILL UTILIZE DESIGNATED MATERIAL STORAGE YARDS. ANY NECESSARY ADDITIONAL AREAS/FACILITIES WILL BE FIELD LOCATED BY SCE AT CONSTRUCTION PROGRESSES.

GENERAL NOTES

1. THIS PLAN IS ACCURATE FOR STORMWATER POLLUTION PREVENTION PURPOSES ONLY.
2. THE INFORMATION ON THIS PLAN IS INTENDED TO BE USED AS A GUIDELINE FOR THE CONTRACTOR AND SUBCONTRACTORS TO COMPLY WITH THE REQUIREMENTS OF THE STATE WATER RESOURCES CONTROL BOARD. FIELD CONDITIONS MAY NECESSITATE MODIFICATIONS TO THIS PLAN.
3. SECTION IV OF THE SWPPP DESCRIBES THE BEST MANAGEMENT PRACTICES TO BE USED ON THIS SITE.
4. IMPLEMENTATION OF THE VARIOUS WATER POLLUTION CONTROL MEASURES WILL CONFORM TO THE REQUIRED CONSTRUCTION STAGING REQUIREMENTS.



TYPICAL SECTION TRENCH PROTECTION DETAIL
NOT TO SCALE

NTS

REFERENCE DRAWINGS	NO.	REVISIONS	DATE	BAP NO.	SUPV.	APPROVED	ENGR.	CK'D	BASE	P.E.

LOCATION: ELDORADO-IVANPAH TRANSMISSION PROJECT TELECOMMUNICATION CONSTRUCTION ACTIVITIES

STORM WATER POLLUTION PREVENTION PLAN SITE MAP

SHEET NO: SITE MAP-01

SCALE: NTS

1 OF 2 SHTS.

SOUTHERN CALIFORNIA EDISON

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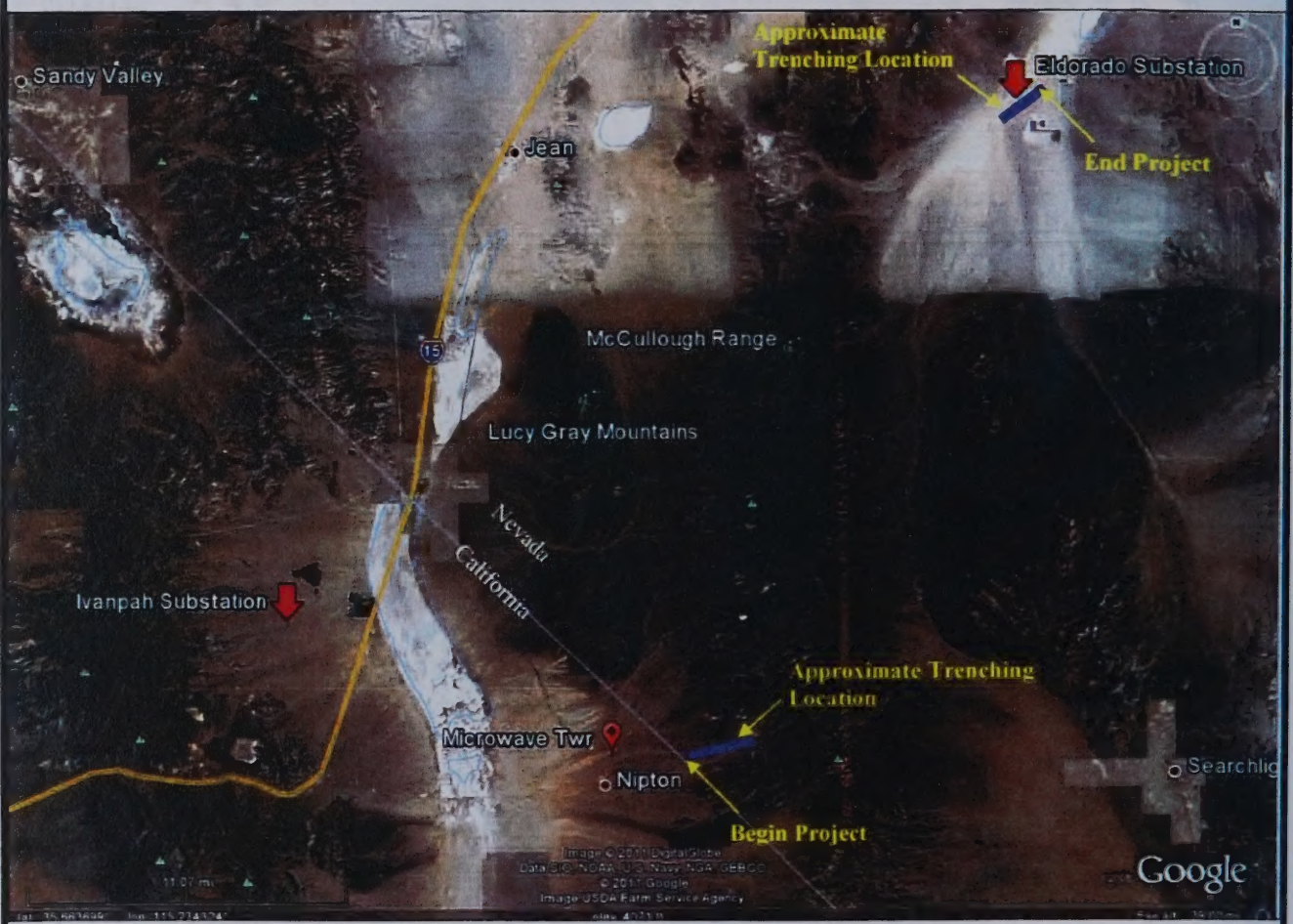
VICINITY MAP

FOR

Fiber Optic Construction Activities
Clark County, Nevada



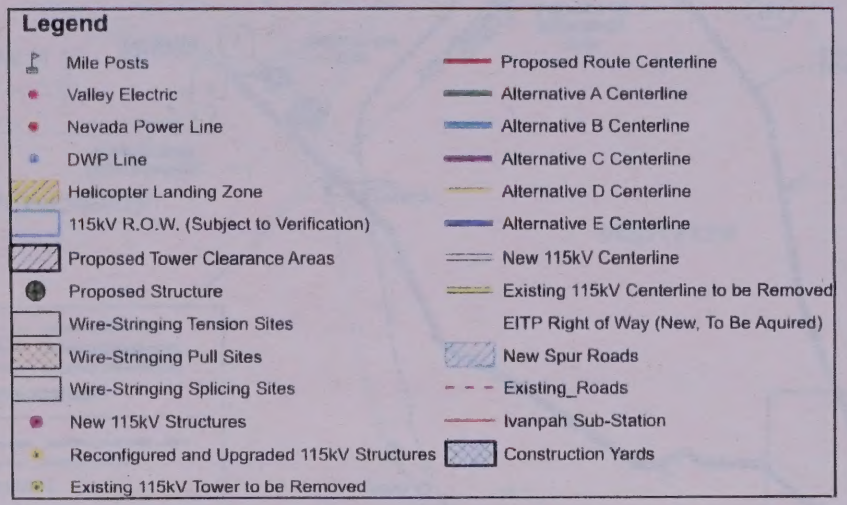
N

N.T.S.

40394

ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)

PRELIMINARY DESIGN
SUBJECT TO REVISION



NOTE: PRELIMINARY ENGINEERING LOCATIONS SHOWN. R.O.W. BOUNDARY, CONSTRUCTION AREAS, ROADS, ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

THIS DOCUMENT IS CONFIDENTIAL

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

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Figure 2-3 **Proposed Project**

Eldorado-Ivanpah Transmission Project

Dust Control Permit

Subtransmission – Clark County Permit 40377

Air Quality & Environmental Management

500 S. Grand Central Parkway, 1st floor
Las Vegas NV · 89155-1776
(702) 455-5942 · Fax (702) 383-9994

40377-0-1

CLARK COUNTY • LAS VEGAS • NORTH LAS VEGAS • BOULDER CITY • HENDERSON • MESQUITE

DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES INCLUDING SURFACE GRADING AND TRENCHING

THIS PERMIT DOES NOT EXEMPT THE PERMITTEE FROM COMPLIANCE WITH THE ENDANGERED SPECIES ACT

Permit Number: **40377** **Mod: 0**

PAYMENT INFORMATION: 20112538

Fee: **$8,400.00**

Balance Due: $ 0

Permittee and Project Information

Permittee: **Southern California Edison**
Permittee Address: **1218 South Fifth Avenue**
City, State, Zip: **Monrovia CA 91016** Fax No.:: **6264622774**
Project Name: **EITP - Subtransmission Line**
Project Address: **Highway 95 to Interstate 15**
Located In: *Township:* **25** *Range:* **62** *Section:* **1** EO Area: **SE/SW**
Acreage This Mod: **60** Total Acreage: **60**
Cross Streets: **Highway 95 to Interstate 15**

Project Contact(s)

Normal Hours: **Kirk Riehl**
Company: **Southern California Edison**
Phone: **(714)814-5643**

After Hours: **Arnel "A.L." Wilson**
Company: **Southern California Edison**
Phone: **(626)302-3174**

Issue Date: 14-Sep-2011 **Expiration Date: 14-Sep-2012**

Effective Date:_____

Notes
ATC

- ○ Request Of Sign Waiver
- ○ Public Works Agreement
- ○ Closure Plan
- ○ Conditional Renewal

DUST CONTROL MEASURES MUST OCCUR 24 HOURS A DAY, 7 DAYS A WEEK

THIS PERMIT IS NOT VALID UNTIL ALL FEES ARE PAID IN FULL AND A COMPLETE COPY IS ON THE PROJECT SITE, INCLUDING CONDITIONS OF PERMIT AND DUST MITIGATION PLAN

It is a condition of the issuance of any operating permit required by the commission or pursuant to any local ordinance for the control of air pollution that the holder of the operating permit agrees to permit inspection of the premises to which the permit relates by any authorized officer of the department at any time during the holder's hours of operation without prior notice. This condition must be stated on each application form and operating permit. NRS 445B.580.

The issuance of this PERMIT does not relieve the PERMITTEE from compliance with all other applicable federal, state, county and local ordinances and regulations. Issuance of this PERMIT shall not be a defense to violations of any applicable ordinances or regulations.

DAQEM Use Only

RECEIVED
CC-DAQEM
2011 AUG 25 A 8:50

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

APPLICATION
DUST CONTROL PERMIT FOR CONSTRUCTION ACTIVITIES

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. **Applicant/Permittee:**

☑ Property Owner ☐ Developer ☐ Prime Contractor ☐ Other _____

Name: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

E-mail Address: Project Manager: roger.~~shultz~~Schultz@sce.com; AQ: arnel.wilson@sce.com

2. **Project:**

Name: EITP - Subtransmission Line

Address: _____ City: _____

Nearest major cross-streets: Highway 95 to Interstate 15

Township(s): 25 Range(s): 62 Section(s): 1

Assessor's Parcel number(s) (Attach map): 214 00 001 021

Project Description: Removal of existing 115 kV line and installation of new subtrans line

Project Acreage: 60.0 acres (rounded to the nearest 0.1 acre, all land that will be disturbed must be included in project acreage)

Permit fees: If the project acreage listed above contains a faction, the project acreage will be rounded up to the next whole number for fee purposes. The rounded up acreage (quantity) value will be used to assess the acreage fee for this permitting action.

Submit the total permit fee, with this application. Permit fees are non-refundable.

You must select one of the following three choices.

☐ This project does not require any offsite street or utility development.

☐ This project requires offsite street/utility development that is not included in this application, and will be added at a later date by modification or additional permit.

☑ This application includes offsite street/utility development. (Area must be marked on the accompanying parcel map. Check all that apply)

Utility Lateral ☑ less than 100 ft. ☐ greater than 100 ft. ☑ Half Street ☐ Full Street

☑ Curb / Entrance ☐ Entity Name and Number of Approved Offsite Plan / Permit / Easement: _____ ☐ Plan Pending ☐ Other

3. **Property Owner (if not applicant):**

Name: _____

4. **Point of Contact for dust control matters and to whom a NOTICE OF VIOLATION should be sent if necessary:**

Name: Arnel "A.L." Wilson Company: Southern California Edison

Address: 1218 South Fifth Avenue

City: Monrovia State: CA Zip: 91016

Telephone: (626) 462-2517 Ext: _____ Fax: (626) 462-2774

Cellular/Pager: (626) 302-3174 After Hours Phone: (714) 915-1525

5. **On-site Superintendent/Supervisor/Foreman contact:**

Name: Kirk ~~Reat~~ Richl Company: _____

On-site phone: (714) 814-5643 Cellular/Pager: (714) 814-5643

DAQEM Dust Class Certification/Card #: DC 0510150 Expiration date: 5-28-13

Have all other on-site supervisory personnel attended the DAQEM Dust Class? ☐ Yes ☒ No

If no, all on-site supervisory personnel must attend a DAQEM Dust Class within 30 days.

7. **By signing this permit application I certify that:**

A. **I am authorized, on behalf of the individual or company listed in Section 1, as Applicant/Permittee, to apply for their Dust Control Permit and to commit to all of the terms and conditions of the requested permit.**

B. **Construction activities will be limited to lands that the applicant/permittee either owns or is authorized to use for construction activities. The permit issued subsequent to this application is not a substitute for obtaining the property owners permission to use his land. Issuance of a Dust Control Permit is intended only for the purpose of controlling emissions of air pollutants and assuring compliance with Air Quality Regulations. The applicant/permittee agrees to hold harmless, indemnify, and defend Clark County, its employees and assigns from any claims that may arise due to any unauthorized use of land for construction activities.**

C. **The permittee accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this permit, comply with the terms and conditions of the permit, the dust mitigation plan and all applicable Air Quality Regulations.**

D. **The applicant/permittee understands that it is a condition of the permit that the permittee agrees to allow the inspection of the site for compliance with the terms and conditions of the permit and Air Quality Regulations at any time during the permittee's hours of operation by a DAQEM officer without prior notice or at any time pursuant to the investigation of a complaint or upon direct observation of emission and/or failure to maintain Best Management Practices.**

E. **I understand that any material misrepresentation made in this application may invalidate the permit and that Clark County may pursue enforcement action against me. In addition, I understand any willful misrepresentation may result in criminal penalties. I declare under penalty of perjury that the foregoing is true and correct.**

Executed on:

August 23, 2011 _____

DATE SIGNATURE

Arnel L. Wilson Air Quality Specialist, SCE

PRINTED NAME TITLE AND COMPANY NAME

Application completed by, if not completed by signatory (Please Print):

Name _____ Phone Number _____ Ext. _____

PAYMENT INFORMATION **TO BE COMPLETED BY THE APPLICANT**

PAYING BY **(Please Print)**

☐ CASH

☑ CHECK CHECK # 0041194705

NAME AND ADDRESS AS IT APPEARS ON CHECK:

So. Calif. Edison

PO Box 700

Rosemead, Ca 91770

Telephone #: _____

☐ CREDIT CARD LAST FOUR DIGITS OF CREDIT CARD NUMBER: _____

EXACT NAME AS IT APPEARS ON CREDIT CARD: _____

FOR DAQEM USE ONLY

9/14/2011 ISSUE DATE | JS 40377 ISSUED BY | 20112538 POS #

8/25/11 DATE PAID | MK RECEIVED BY

DAQEM REVIEW: _____ DATE: 9-13-11

BLASTING APPROVAL (if applicable): _____ DATE: _____

DEMOLITION APPROVAL (if applicable): _____ DATE: _____

COMPLIANCE AREA ASSIGNMENT: SE & SW Hydrographic Area: 167-Eldorado Valley

☐ Airport ☐ Blasting ☐ Commercial ☐ Demo-Structure ☐ Demo–Other ☐ Staging/Stockpiling

☐ Highway ☐ Schools ☐ Residential ☐ Public Works ☐ Flood Detention ☐ Utilities ☑ Misc.

Need to notify at least 2 weeks prior to demolishing towers. See letter

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Arnel L. Wilson
Southern California Edison
1218 South Fifth Avenue
Monrovia, CA 91016
August 23, 2011

Clark County
Department of Air Quality and Environmental Management
500 S. Grand Central Parkway
Las Vegas, NV 89155

Attention: Jennifer Lipkin

RE: Supplement to the Dust Mitigation Plan for EITP - Subtransmission.

This letter is written as a supplement to the Dust Mitigation Plan for the Eldorado-Ivanpah Transmission Project (EITP) – Subtransmission.

Project Description

This portion of the EITP Project involves the removal of the existing 115-kV subtransmission line, which will be replaced with a new 230-kV transmission line (the installation of which is covered in the *EITP – 230-kV Permit Application*). 250 towers will be removed, of which approximately 207 are located in Nevada.

Additionally, an approximately 600 to 800 foot long new section of looped 115-kV line will be installed.

A total of approximately 60 acres will be disturbed during the removal of the 115-kV line and installation of the new portion of 115-kV line.

Expenditure towards dust control for the proposed project is anticipated to be approximately $25 million.

Site Plan

According to the draft construction schedule, the removal of the existing subtransmission line and structures would take place between March 2012 and September 2012. Installation of the new 115-kV line would take place between February 2012 and May 2012.

Please refer to the Eldorado-Ivanpah Transmission Line Road Story for existing and future tower locations and aerial photos.

Additional Explanation of Control Measures

Dust control measures include:

2244 Walnut Grove Ave.
Rosemead, CA 91770

- Frequent watering or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes persistent visible emissions of fugitive dust beyond the work area.
- Pre-watering of soils prior to clearing and trenching.
- Pre-moistening of, prior to transport, import and export dirt, sand or other loose materials.
- Dedication of water truck or high-capacity hose to any soil screening operations
- Minimization of drop height of material through screening equipment
- Reduction of the amount of disturbed area where possible
- Planting of vegetative ground cover in disturbed areas after construction activities have ceased within a time period that is consistent with the Project's Reclamation Plan.

Contingency

Contingency measures include the utilization of one 24-hour, on-call person for fugitive dust measure. Upon discovery of any inadequacies, more frequent application procedures will be exercised, and/or dust suppressants will be utilized according to BLM guidelines.

Soil Stabilization Measures

Disturbed soil will be stabilized with the utilization of water applied via water truck periodically throughout the workday. A final application will be applied at the end of the day, with an amount sufficient to maintain a surface crust. Daily records of dust control measures will be maintained.

Employee Dust Control Training and Compliance

The contractor for this portion of the project has not yet been selected. However, once the contractor has been selected, all site supervisors/manager and water truck drivers will be required to complete the DAQEM Dust Control Training and their names and certification numbers will be provided to you. Once the on-site Dust Control Monitor has been selected, form DCP09: Construction Site Dust Control Monitor will be completed and submitted.

Sincerely,

Arnel L. Wilson
Air Quality Specialist

Protecting the air we share

Air Quality

DUST MITIGATION PLAN FOR ALL PROJECTS

Project Name: EITP - Subtransmission Line

Permittee Name: Southern California Edison

Identify the Project Soil "Particulate Emission Potential" (check all that apply):

Using silt and optimum moisture content to determine the particulate emission potential (PEP) is the preferred method.

☑ PEP determined using generalized PEP determination maps included in the Dust Control Handbook.

☐ PEP determined using silt vs. optimum moisture table in Figure 2 of the Dust Control Handbook.

Percentage of silt through a #200 sieve: ___% Optimum moisture content: ___%

PEP for this project is determined to be:

☑ High ☐ Moderate High ☑ Moderate Low ☐ Low

High in lieu of DCP 12

Water source: ☐ Hydrant with Jones Valve ☐ Fire hose ☑ Water trucks/pulls ☐ Well

☑ Stand tanks ☐ Ponds ☐ Other:_____

PROJECT ACTIVITIES CHECKLIST

Instructions:

Place a check mark in the box to the right of each Project Activity that will occur on your project. If additional soil disturbing activities that are not on the checklist are to be included in the project, list them on a separate page and provide a description. For a more complete description of the listed activities, see the Control Measures Selection Pages (Form DCP03) that follow or refer to the Best Management Practices for dust control in the Dust Control Handbook.

BMP 10 Disturbed Soil and BMP 20 Trackout Prevention and Cleanup must be marked for every Dust Mitigation Plan.

CONTROL MEASURES SELECTION PAGES

Instructions:

For each project activity that you have selected on the Project Activities Checklist you must include the corresponding Control Measures Selection Page. Read and understand each item listed as a "Requirement" on these included pages. Where control measure options are listed, place a check in the box in front of the control measure you will use to meet that requirement. You must select at least one control measure where a choice is listed. In addition you must select the control measure that corresponds to your PEP as listed above, if applicable.

NOTE: PROJECTS 10 ACRES AND LARGER MUST COMPLETE A SUPPLEMENT TO THE DUST MITIGARTION PLAN (APPENDIX B-1 AND B-2).

Protecting the air we share

Air Quality

PROJECT ACTIVITIES CHECKLIST

Project Name: EITP - Subtransmission Line

Permittee Name: Southern California Edison

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY COMPLETE THE CORRESPONDING CONTROL MEASURES SELECTION PAGE AND INCLUDE WITH APPLICATION.

BMP	Project Activity	Check All That Apply
01	Backfilling Filling area previously excavated or trenched.	☐
02	Blasting - Abrasive Sandblasting and/or abrasive blasting.	☐
03	Blasting Soil & Rock Explosive blasting of soil and rock.	☐
04	Clearing & Grubbing Clearing and grubbing for site preparation and vacant land cleanup.	☑
05	Clearing Forms, Foundations and Slabs Clearing and cleaning of forms, foundations and slabs prior to pouring concrete.	☑
06	Crushing Crushing of construction and demolition debris, rock and soil.	☐
07	Cut and/or Fill Cut and/or fill soils for site grade preparation.	☐
08	Demolition - Implosion Implosive demolition of a structure, using explosives.	☐
09	Demolition - Mechanical/Manual Mechanical and manual demolition of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls and/or removal of transit pipe	☑
10	Disturbed Soil **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Disturbed soil throughout project including between structures.	☑
11	Disturbed Land - Long Term Stabilization Large tracts of disturbed land that will not have continuing activity for more than 30 days.	☑
12	Dust Suppressants - Selection and Use Selection and use of chemical and organic dust suppressing agents and other dust palliatives.	☐
13	Importing/Exporting Materials Importing or exporting of soil, aggregate, decorative rock, debris, Type II and other bulk material.	☑
14	Landscaping Installation of sod, decorative rock, desert or other landscape material.	☐
15	Paving/Subgrade Preparation Subgrade preparation for paving streets, parking lots, etc.	☐
16	Sawing/Cutting Material Sawing or cutting materials such as concrete, asphalt, block or pipe.	☐
17	Screening Screening of rock, soil or construction debris.	☐
18	Staging Areas Staging areas, equipment storage, vehicle parking lots, and material storage areas.	☑
19	Stockpiles Stockpiling of materials, such as Type II, other soils, rock or debris, for future use or export.	☐
20	Trackout Prevention and Cleanup **THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS** Prevention and cleanup of mud, silt and soil tracked out onto paved roads.	☑
21	Traffic - Unpaved Routes and Parking Construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.	☑
22	Trenching Trenching with track or wheel mounted excavator, shovel, backhoe or trencher.	☐
23	Truck Loading Loading trucks with materials including construction and demolition debris, rock and soil.	☑

EITP - Subtransmission Line

CLEARING AND GRUBBING — BMP 04

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 04-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 04-2 Apply and maintain a dust palliative on surface soils where support equipment and vehicles will operate.

Requirement: Stabilize soil during clearing and grubbing activities.

- ☑ 04-3 **L & ML:** Apply water during clearing and grubbing activities.
- ☐ 04-4 **MH:** Apply water and tackifier mixture during clearing and grubbing activities.
- ☑ 04-5 **H:** Apply water and surfactant mixture during clearing and grubbing activities.

Requirement: Stabilize disturbed soil immediately after clearing and grubbing activities.

- ☑ 04-6 Water disturbed soils to form crust immediately following clearing and grubbing activities.
- ☐ 04-7 Apply and maintain a dust palliative on disturbed soils to form crust immediately following clearing and grubbing activities.

Recommendations: Maintain live perennial vegetation and desert pavement where possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Subtransmission Line

CLEARING FORMS, FOUNDATIONS AND SLABS — BMP 05

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible emissions to no more than an average of 20% opacity for any period aggregating 3 minutes in any 60-minute period pursuant to Air Quality Regulations.

- ☑ 05-1 Use single stage pours, unless prohibited by engineering design or building code, to minimize clearing.

Note: At least one of the following must be selected.

- ☑ 05-2 Use water spray to clear forms, foundations and slabs.
- ☐ 05-3 Use sweeping and water spray to clear forms, foundations and slabs.
- ☐ 05-4 Use industrial vacuum to clear forms, foundations and slabs prior to the use of high pressure air to blow soil and debris.
- ☐ 05-5 Use industrial vacuum to clear forms, foundations and slabs.

Recommendations: Verify Building Code Restrictions for use of water on slabs.

Avoid use of high pressure air to blow soil and debris from forms, foundations and slabs.

EITP - Subtransmission Line

DEMOLITION - Mechanical/Manual — BMP 09

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For renovation or demolition of a structure, a Demolition Supplemental form (see Appendix A) must be filled out, submitted and approved by the Control Officer prior to commencing demolition.

Requirement: An asbestos survey must be conducted on any facility or structure that is subject to NESHAP requirements before demolition can commence.

Requirement: A complete Clark County NESHAP Notification form must be submitted to the DAQEM at least ten working days prior to demolition. The asbestos survey must be attached to this notification.

Requirement: Stabilize surface soils where support equipment and vehicles will operate.

- ☑ 09-1 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 09-2 Apply and maintain a dust palliative to surface soils where support equipment and vehicles will operate.
- ☐ 09-3 Area where support equipment and vehicles will operate is completely covered with paving or concrete.

Requirement: Stabilize demolition debris during handling.

- ☑ 09-4 Apply water to demolition debris during handling.

Requirement: Stabilize debris following demolition.

- ☑ 09-5 Apply water to stabilize demolition debris.
- ☐ 09-6 Apply a dust palliative to stabilize demolition debris.

Requirement: Stabilize surrounding area following demolition.

- ☑ 09-7 Apply water to stabilize surrounding area following demolition.
- ☐ 09-8 Apply and maintain a dust palliative to stabilize surrounding area following demolition.

See also: BMP 23: TRUCK LOADING.

EITP - Subtransmission Line

DISTURBED SOIL — BMP 10

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: For each non-linear project to be permitted for 5 acres or less; install perimeter wind barrier 3 feet or more in height made of material with a porosity of 50% or less.

Requirement: Limit vehicle traffic and disturbance of soils where possible.

☑ 10-1 Limit vehicle traffic and disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

Requirement: Stabilize and maintain stability of all disturbed soil throughout construction site.

Note: You must choose one or more of the following.

☑ 10-2 Apply water to stabilize disturbed soils. Soils must be kept in a sufficiently damp, crusted or covered condition.

☐ 10-3 Apply and maintain a dust palliative based on soil type and future plans.

Requirement: Soil conditions, including preventive and corrective measures, must be recorded every day the construction project is active.

☑ 10-4 Record soil conditions and dust control actions in daily project records.

Recommendations: If interior block walls are planned, install as early in the construction as possible.

See also: BMP 11: DISTURBED LAND – Long-Term Stabilization, if no continuing activity will occur within 30 days.

EITP - Subtransmission Line

DISTURBED LAND – Long-Term Stabilization — BMP 11

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Stabilize soil to meet standards required by Air Quality Regulation Section 90.

- ☑ 11-1 Apply and maintain a dust palliative on disturbed soils for long-term stabilization. contingency
- ☐ 11-2 Stabilize disturbed soil with vegetation for long-term stabilization.
- ☐ 11-3 Pave or apply surface rock for long-term stabilization.
- ☐ 11-4 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☑ 11-5 Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization.

Requirement: Prevent access to limit soil disturbance.

- ☑ 11-6 Prevent access by fencing, ditches, vegetation, berms or other suitable barrier or means approved by the Control Officer.

Recommendations: Plant perimeter vegetation early. Use of native and drought-tolerant plants with greater than 50 % silhouette area is encouraged.

See also: BMP 12: DUST SUPPRESSANT, DUST PALLIATIVE AND SURFACTANT – Selection and Use.

EITP - Subtransmission Line

IMPORTING/EXPORTING SOIL, ROCK AND OTHER BULK MATERIAL — BMP 13

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 13-1 Apply water and limit vehicle speeds to 15 mph on the work site.
- ☐ 13-2 Apply and maintain dust suppressant on haul routes.

Requirement: Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage.

Requirement: Maintain 3-6 inches of freeboard to minimize spillage.

Requirement: Stabilize materials during transport on site.

- ☐ 13-3 Use tarps or other suitable enclosures on haul trucks.
- ☑ 13-4 Stabilize materials with water.

Requirement: Clean wheels and undercarriage of haul trucks prior to leaving construction site.

Recommendations: Verify State and local laws, concerning the hauling of bulk materials on public roadways.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP.
BMP 23: TRUCK LOADING.

EITP - Subtransmission Line

STAGING AREAS — BMP 18

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 18-1 Limit vehicle speeds to 15 mph in the staging area and on all unpaved access routes.
- ☐ 18-2 Apply and maintain dust suppressant on all vehicle traffic areas in the staging areas and unpaved access routes.

Requirement: Stabilize staging area soils during use.

- ☑ 18-3 Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- ☐ 18-4 Apply and maintain a dust palliative to surface soils where support equipment and vehicles will be operated.

Requirement: Stabilize staging area soils at project completion.

- ☐ 18-5 Apply a dust palliative.
- ☑ 18-6 Apply screened or washed Type II aggregate.
- ☐ 18-7 Use wind breaks in accordance with a site-specific plan approved by the Control Officer and Region IX Administrator of the EPA.
- ☐ 18-8 Pave with thin paving.
- ☐ 18-9 Completed project will cover staging area with buildings, paving, and/or landscaping.
- ☐ 18-10 Apply water to form adequate crust and prevent access.

Recommendations: Limit size of staging areas.

Limit ingress and egress points.

See also: BMP 20: TRACKOUT PREVENTION AND CLEANUP

EITP - Subtransmission Line

TRACKOUT PREVENTION AND CLEANUP — BMP 20

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: In soils that have a PEP classification of "High", pave construction activities roadways as early as possible.

Requirement: Use of soil to create a ramp for vehicle access over a curb is prohibited.

Requirement: Trackout conditions, including preventive and corrective measures, must be recorded daily for every day that the construction project access is used by vehicles.

- ☑ 20-1 Record soil conditions and dust control actions in daily project records.

Requirement: Prevent dust from trackout.

- ☐ 20-2 Immediately clean trackout from paved surfaces to maintain dust control. Trackout must not extend 50 feet or more.
- ☑ 20-3 Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. Trackout must not extend 50 feet or more and must be cleaned daily, at minimum.

Requirement: Install and maintain trackout control devices in effective condition at all access points where paved and unpaved access or travel routes intersect.

- ☐ 20-4 Install gravel pad(s) consisting of 1" to 3" rough diameter, clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness.
- ☐ 20-5 Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness.
- ☐ 20-6 Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness.
- ☑ 20-7 Install wheel shakers in the event that trackout cannot be controlled with gravel pads.
- ☐ 20-8 Install wheel washer in the event that trackout cannot be controlled with gravel pads and wheel shakers.
- ☐ 20-9 Motorized vehicles will only operate on paved surfaces.

(Continued on next page)

Requirement: All exiting traffic must be routed over selected trackout control device(s).

☑ 20-10 Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s).

☐ 20-11 Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes.

EITP - Subtransmission Line

TRAFFIC – Unpaved Routes and Parking Areas — BMP 21

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Limit visible dust opacity from vehicular operations.

- ☑ 21-1 Limit vehicle speeds to 15 mph on all unpaved routes and parking areas.
- ☐ 21-2 Apply and maintain dust palliative on all vehicle travel areas.

Requirement: Stabilize all haul routes.

- ☑ 21-3 Apply water to haul routes and maintain in a stabilized condition.
- ☐ 21-4 Apply a dust palliative to haul routes and maintain in a stabilized condition.
- ☐ 21-5 Apply gravel to haul routes and maintain in a stabilized condition.
- ☐ 21-6 Supplement dust palliative or aggregate applications with watering, if necessary.

Requirement: Stabilize all off-road and parking areas.

- ☑ 21-7 Apply water to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-8 Apply gravel to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-9 Apply recycled asphalt (or other suitable material) to off-road traffic and parking areas and maintain in a stabilized condition.
- ☐ 21-10 Apply and maintain a dust palliative (designed for vehicle traffic) to off-road traffic and parking areas and maintain in a stabilized condition.

Recommendations: Use of bumps or dips for speed control is encouraged.

Apply paving as soon as possible to all future roadway areas for PEP categories other than "High".

EITP - Subtransmission Line

TRUCK LOADING — BMP 23

YOU MUST SELECT AT LEAST ONE CONTROL MEASURE FOR EACH REQUIREMENT. PLACE A CHECK IN THE BOX IN FRONT OF YOUR SELECTION.

Requirement: Ensure all loads are covered prior to leaving the construction site and traveling on public roadways.

Requirement: Stabilize surface soils where loaders, support equipment and vehicles will operate.

- ☑ 23-1 Pre-water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate.
- ☐ 23-2 Apply and maintain a dust palliative on surface soils where loaders, support equipment and vehicles will operate.

Requirement: Stabilize material during loading.

- ☑ 23-3 Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping.

Note: You must selected 23-3 if PEP is greater than LOW, in addition one of the following must be selected.

- ☐ 23-4 **L & ML:** Mix material with water prior to loading.
- ☑ 23-5 **L & ML:** Spray material with water while loading.
- ☐ 23-6 **MH:** Mix material with a water and tackifier mixture prior to loading.
- ☐ 23-7 **MH:** Spray material with a water and tackifier mixture while loading.
- ☐ 23-8 **H:** Mix material with a water and surfactant mixture prior to loading.
- ☑ 23-9 **H:** Spray material with a water and surfactant mixture while loading.

DAQEM
DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

CONSTRUCTION ACTIVITIES DUST CONTROL PERMIT SUPPLEMENTAL PERMITS/APPROVALS CHECKLIST

The following construction activities require permits or approval in addition to a Dust Control Permit. Permits or approvals must be obtained prior to conducting the activity. This form must be submitted with every Dust Mitigation Plan. *Check all activities that apply to the construction project.*

Activities requiring a Portable Source Permit:
(Comply with Portable Source requirements prior to installing this equipment on the project site.)

Operation of a: List Name of Company and/or Permit #

- ☐ powered crusher at temporary locations. _____
- ☐ powered screen at temporary locations. _____
- ☐ concrete batch plant at temporary locations. _____
- ☐ asphalt batch plant at temporary locations. _____

Activities requiring Supplemental Permit:
(Submit applicable supplemental forms. Asbestos survey is required for any size demo/remodel. NESHAP notification is required for ANY size demolition or for remodel if RACM is found.)

- ☐ Blasting to fracture rock, hardpan, or caliche.
- ☐ Blasting to implode a structure.
- ☐ Demolition of a structure greater than 1,000 square feet. — see attached letter will modify to include
  - ☐ Structural remodeling
  - ☐ Structure relocation

Activities requiring Authority to Construct (ATC) Certificate and Operating Permit:
(An ATC must be obtained prior to installation of this equipment/facility.)

- ☐ Construction of or installation of any Emission Unit
  - ☐ Gasoline Dispensing Facility
  - ☐ Cooling Tower
  - ☐ Dry Cleaning Equipment
  - ☐ Plating Shop
  - ☐ Incinerator
  - ☐ Boiler
  - ☑ Emergency Standby Generator or Other Internal Combustion Engine
  - ☐ Woodworking Process Equipment
  - ☑ Power Generation Facility or Equipment
  - ☐ Crushing or Screening Stationary Source
  - ☐ Concrete or Asphalt Plant Stationary Source
  - ☐ Commercial Surface Coating Equipment including Paint Spray Booth
  - ☐ Other Source of PM_{10}, CO, VOC, NO_x, SO_2, Lead, Hazardous Air Pollutant, or Toxic Chemical Substance

- ☐ Activities Listed Above Do Not Apply to this Construction Project:

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Arnel L. Wilson
Southern California Edison
1218 South Fifth Avenue
Monrovia, CA 91016

August 25, 2011

Clark County
Department of Air Quality and Environmental Management
500 S. Grand Central Parkway
Las Vegas, NV 89155

Attention: Larry Parks

RE: Subtransmission Removal Demolition Notification Form Submittal

This letter is written to confirm guidance that you provided verbally regarding submittal of the Demolition Notification Form for the removal of the 115 kV subtransmission line.

Background

This portion of the EITP Project involves the removal of the existing 115-kV subtransmission line, which will be replaced with a new 230-kV transmission line (the installation of which is covered in the *EITP – 230-kV Permit Application*). 250 towers will be removed, of which approximately 207 are located in Nevada.

According to the draft construction schedule, the removal of the existing subtransmission line and structures would take place between March 2012 and September 2012. Installation of the new 115-kV line would take place between February 2012 and May 2012.

Please refer to the Eldorado-Ivanpah Transmission Line Road Story for existing and future tower locations and aerial photos. Also, the draft Plan of Development (POD.pdf) describes the removal process. Solid waste handling and disposal procedures will be conducted as specified in the Waste Disposal Plan, the Salvage Services Manual, and the Waste Management Manual which will be prepared. In addition, we will have contracts in place with approved waste contractors and landfill disposal sites prior to commencement of construction activities.

Guidance

It was your suggestion that you could review the fugitive dust permit application without a completed Demolition Notification Form at this time since the work is not scheduled to begin until March 2012.

2244 Walnut Grove Ave.
Rosemead, CA 91770

SCE will keep you informed of the progress and will contact you in January 2012 regarding the schedule for conducting any required asbestos surveys and submitting the Demolition Notification Form.

SCE intends to submit the required information at least two weeks before any demolition.

Please let me know if you need any additional information.

Sincerely,

Arnel L. Wilson
Air Quality Specialist

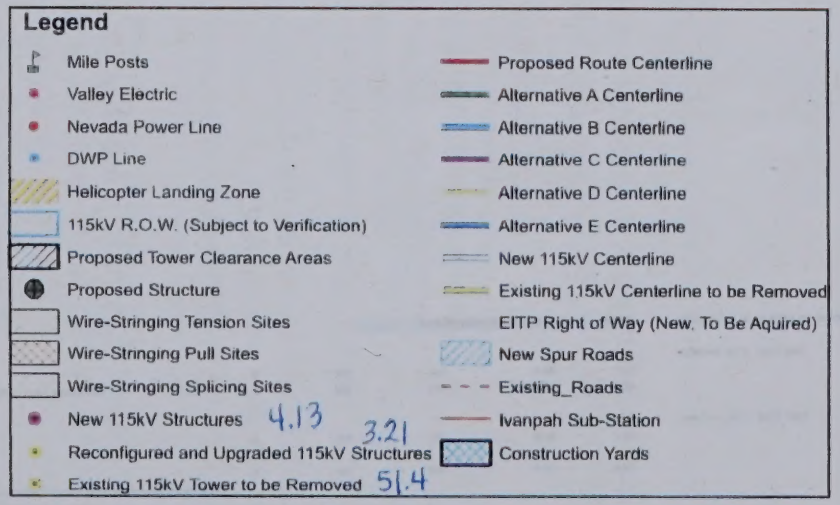
Subtransmission

Removal of Existing Subtransmission Line	Road Story Legend	Number of areas	Disturbed Area Length (feet)	Disturbed Area Width (feet)	Ground disturbance per area (acres)	Total area disturbed (acres)	Approximate Dates of Activity	Road Story Correlating Page Numbers
Lattice steel H frame		208	150	75	0.26	53.72		
Lattice steel structure		13	150	75	0.26	3.36		
Wood H Frame		23	100	75	0.17	3.96		
Wood Pole		6	100	75	0.17	1.03		
TOTAL		250				62.07	March 2012 - September 2012	
CALIFORNIA TOTAL		43				10.6		
NEVADA TOTAL	Existing 115kV Tower to be Removed	207				**51.4**		Refer to "Proposed Alternative", pgs 1-69, 81, 106, 114, 119
New Subtransmission Line								
Remove existing lattice steel H frame and construct new TSP	Reconfigured and Upgraded 115kV Structures	1	200	100	0.46	0.46		
Remove existing lattice steel H frame and construct new LWS H frame		6	200	100	0.46	2.75		
						3.21	February 2012 - May 2012	Pages 70 and 71
Construct new tubular steel pole	New 115kV Structures	5	200	100	0.46	1.38		
Construct new LWS H frame		6	200	100	0.46	2.75		
						4.13	February 2012 - May 2012	Page 69
					SUBTRANSMISSION TOTAL	**58.78**	Rounded up to 60 acres for permit	

ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)

PRELIMINARY DESIGN
SUBJECT TO REVISION

mod 0 = 60.0
estimated acreage
Accurate acreage & maps
will be provided prior
to commencing construction
activity



NOTE: PRELIMINARY ENGINEERING LOCATIONS SHOWN. R.O.W. BOUNDARY, CONSTRUCTION AREAS, ROADS, ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

THIS DOCUMENT IS CONFIDENTIAL

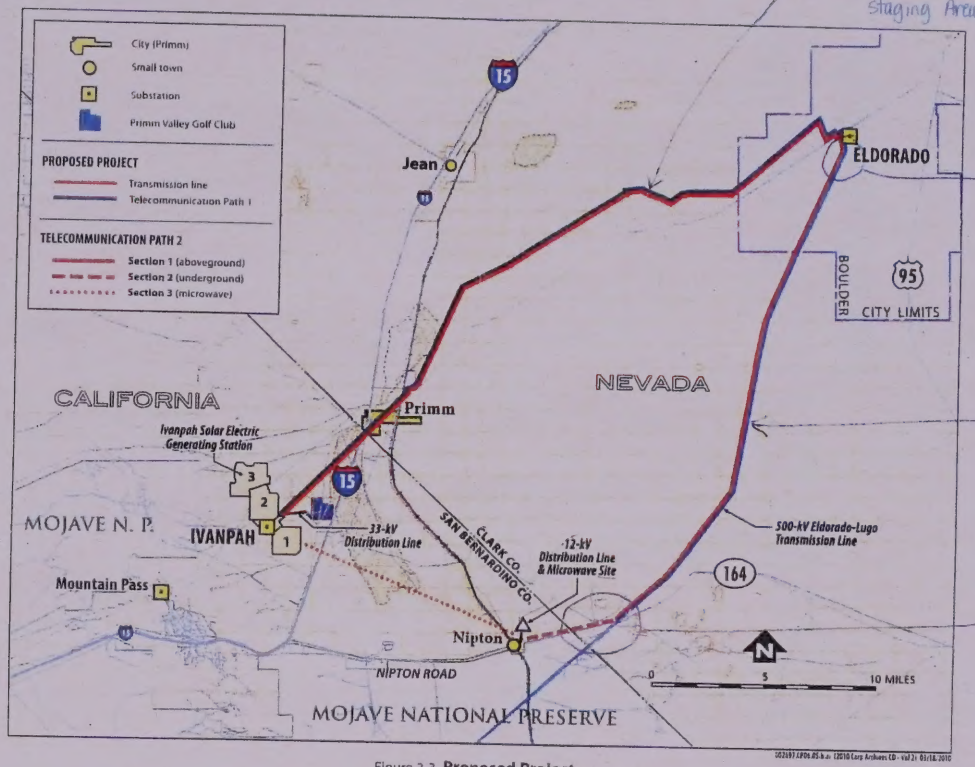
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Details available in Koda story (permits)

EITP Subtransmission Line
Removal of 115 kV towers
Installation of new 230 kV towers
Access Road work
Staging Areas

EITP Transmission Line

40377



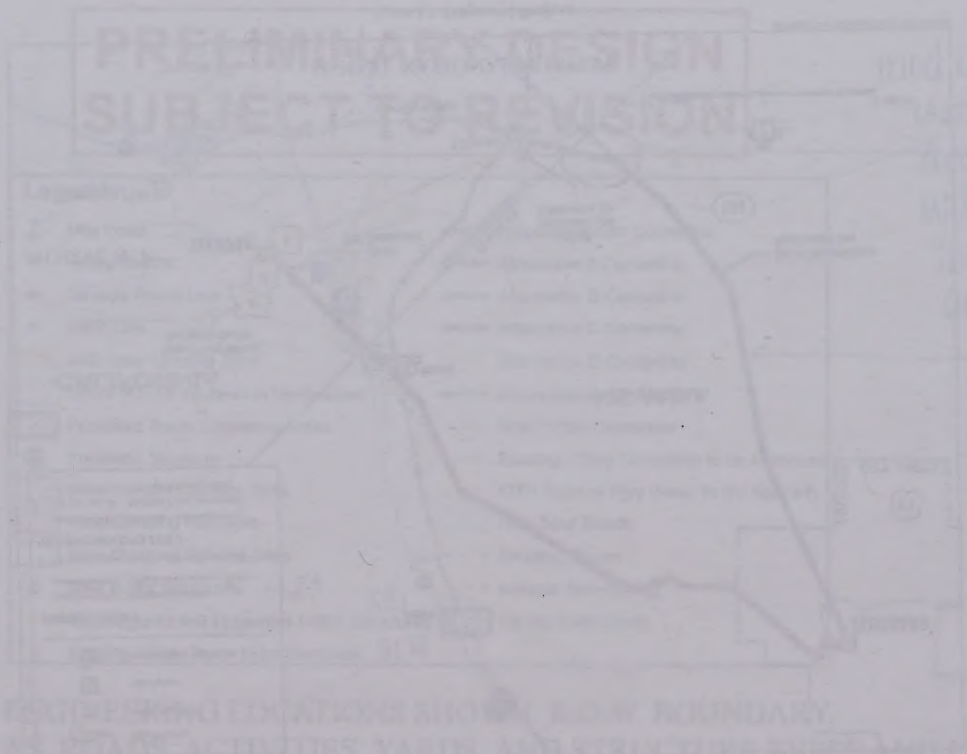
EITP Underground Fiber Optics

Fiber Optic Strings

EITP Underground Fiber Optic

Figure 2-3 **Proposed Project**

ELDORADO-IVANPAH TRANSMISSION PROJECT (EITP)
ROAD STORY
(CONSTRUCTION VERSION)



NOTE: PRELIMINARY ROAD ALIGNMENTS SHOWN ARE WITHIN BOUNDARY. CONSTRUCTION AREAS, ROAD ACTIVITIES, YARDS, AND STRUCTURE TYPES AND LOCATIONS WILL BE FIELD VERIFIED AND ADJUSTED AS NECESSARY DURING FINAL ENGINEERING AND CONSTRUCTION.

EDISON

EITP ROAD STORY
REV 1
November 18, 2009

Eldorado-Ivanpah Transmission Project

Special Use Permit
Clark County Permit UC-0553-10

Department of Comprehensive Planning
Land Use Planning

500 S Grand Central Pky • Box 551744 • Las Vegas NV 89155-1744
(702) 455-4314 • Fax (702) 455-3271

Nancy Lipski, Director

NOTICE OF FINAL ACTION

January 12, 2011

JENNIFER SLOAN HILSABECK
3993 HOWARD HUGHES PARKWAY
SUITE 600
LAS VEGAS, NV 89169

REFERENCE: UC-0553-10

On the date indicated above, a Notice of Final Action was filed with the Clark County Clerk, Commission Division, pursuant to NRS 278.0235 and marking the commencement of the twenty-five (25) day limitation period specified wherein.

The above referenced application was presented before the Clark County Planning Commissioners at their regular meeting of **January 4, 2011** and was **APPROVED** subject to the conditions listed below and/or on the attached sheet. You will be required to comply with all conditions prior to the issuance of a building permit or a business license whichever occurs first.

Time limits to commence, complete or review this approval apply only to this specific application. A property may have several approved applications on it; each will have its own expiration date. **It is the applicant's responsibility to keep the application current, and also provide a current contact name, address, and phone number to this department at the above address. This information must be submitted in writing with the application number referenced.**

CONDITIONS:

Current Planning

- **All applicable standard conditions for this application type.**
- **Applicant is advised that any change in circumstances or regulations may be justification for the denial of an extension of time; and that this application must commence within 2 years of approval date or it will expire.**

Public Works – Development Review

- **Coordinate dust mitigation with the Department of Air Quality and Environment Management (DAQEM);**
- **Apply to Bureau of Land Management should additional rights-of-way be required;**
- **Apply to Boulder City should additional rights-of-way be required;**
- **Any disturbance within the flood zone may require a drainage study and compliance;**
- **Nevada Department of Transportation approval.**

Department of Aviation

- **Applicant is required to file a valid FAA Form 7460-1, "Notice of Proposed Construction or Alteration" with the FAA, in accordance with 14 CFR Part 77; no building permit or other construction permit shall be issued for any structure greater than 35 feet above the surface of land that, based upon the FAA's 7460 airspace determination (the outcome of filing the**

BOARD OF COUNTY COMMISSIONERS
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DONALD G. BURNETTE, County Manager

Department of Comprehensive Planning
Land Use Planning

500 S Grand Central Pky • Box 551744 • Las Vegas NV 89155-1744
(702) 455-4314 • Fax (702) 455-3271

Nancy Lipski, Director

FAA Form 7460-1) would (a) constitute a hazard to air navigation, (b) would result in an increase to minimum flight altitudes during any phase of flight (unless approved by the Department of Aviation), or (c) would otherwise be determined to pose a significant adverse impact on airport or aircraft operations.

- **Applicant is advised that FAA's airspace determinations are dependent on petitions by any interested party and the height that will not present a hazard as determined by the FAA many change based on these comments; and that the FAA's airspace determinations include expiration dates and the separate airspace determinations will be needed for construction cranes or other temporary equipment.**

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